THE IRON TRADE REVIEW

Volume XLIV CLEVELAND, JANUARY 14, 1909 Number 2

NEW YORK CENTRAL

APPEARS WITH AN INQUIRY FOR STEEL RAILS.

Sales of Pig Iron to Pipe and Radiator Companies—Coke Shows Weakness and Production May be Curtailed.

The principal development of the week was the appearance of the New York Central Lines in the market with an inquiry for 80,000 tons of steel rails. The International & Great Northern railroad is inquiring for 22,000 tons, and the Great Northern for 8,000 tons. One of the rail mills at the Gary plant has been started. Sales of track fastenings include 5,000 tons of spikes, 8,000 kegs of bolts and 2,600 tons of angle bars.

Pig Iron Conditions

The principal sales of pig iron were 20,000 tons of southern to a Philadelphia pipe interest, and 12,000 tons to the leading radiator company by a Buffalo furnace. In the east there is very little buying, but the undercurrent seems to be strong. In the central west there is only fair inquiry, and in the south the market is quiet, with reports of some concessions having been made.

Cast Iron Pipe Price

An advance of $1 per ton in cast iron pipe is announced at Chicago. Providence has purchased 1,400 tons of pipe, and Duluth 1,500 tons. The demand for sheet shows some improvement, and the leading interest is operating about 63 per cent of its capacity.

Railroad Buying

In addition to the inquiries for steel rails, railroads have been calling for bids on cars. The rolling of the recent rail order of the Pennsylvania has been begun by the Carnegie Steel Co. Prompt shipment is requested. The Northern Pacific is about to close on 200 box cars, and the Pennsylvania is figuring on 500 to 600 box cars. The full inquiry for the Pennsylvania system now in the market is for 2,600 cars for lines west. The Western Maryland is figuring on 900 cars.

Structural Material

Orders for structural material are of only moderate volume. The tonnage for the Crane-Best plant near Pittsburg was divided between the American Bridge and the Riter-Conley companies. The Jones & Laughlin Steel Co. has taken a contract for 1,300 tons for a Baltimore warehouse, and the McClintic-Marshall Construction Co. has received an order for 800 tons for school buildings in Philadelphia. The Triumph Electric Co., Cincinnati, has ordered 850 tons from the Interstate Engineering Co., and the West Penn Steel Co. is receiving bids on its new plant, involving about 1,000 tons.

Coke and Old Material

The coke market shows some signs of weakness, as the demand for furnace coke is not up to expectations, and independent interests are taking steps to curtail production. The old material market is weaker at Pittsburg, Cleveland and Chicago, but is stronger at Philadelphia.

NEW STEEL PLANT

Will Turn Out Billets, Bars and Sheets in Pittsburg District.

A new steel plant for the manufacture of open-hearth steel billets, sheet bars and sheets is about to be added to the industries of the Pittsburg district by the West Pennsylvania Steel Co., a new corporation organized by former officials of several steel companies of that territory. A mill site has been acquired at Brackenridge, Pa., situated on the West Pennsylvania division of the Pennsylvania railroad and within the limits of the Pittsburg freight district. While no contracts have yet been awarded, this action will be taken shortly, and it is expected that the works will be in operation by fall.

The open-hearth and bar mill department will occupy a building 75 x 368 feet, and the equipment will consist of one 80-ton open-hearth furnace and one three-high 30-inch combination bar and billet mill. The sheet department will consist of a building 80 x 312 feet with a 50-foot lean-to its entire length, in which will be installed three sheet mills complete and two stands of cold rolls. In addition there will be a small power and boiler house. The main buildings will be of heavy steel construction equipped with crane run-ways.

The estimated monthly capacity of the plant will be 3,200 gross tons of ingots, 2,900 gross tons of bars and 900 net tons of sheets. Special reference will be paid to the manufacture of high grade sheets used in electrical apparatus, for stamping and enameling purposes and for other specialized products. The arrangement of the plant provides for the ready addition of sheet mills as trade requirements warrant.

The organizers of the company are experienced steel men. John McGinley will be general manager, Chas. K. Nichols, superintendent of the finishing mills and finishing department, J. E. Ober, metallurgist, John Stener, superintendent of the bar and billet mill and Julian Burdick, general manager of sales. These men have formerly been connected in a similar capacity with the Allegheny Steel Co. and Interstate Steel Co. The executive officers of the company are: President, Joel W. Burdick, Albany, N. Y.; vice president, John McGinley, Pittsburg; secretary and treasurer, Arthur L. Ober, Pittsburg. The capital stock of the company is $700,000, of which $350,000 is cumulative 7 per cent preferred and $350,000 is common stock.

THE WEEK IN IRON CENTERS

PITTSBURG.

New York Central Inquiry—Weakness in Coke—Few Pig Iron Sales.

Office of THE IRON TRADE REVIEW,
510 Park Bldg., Jan. 12.

Progressive developments in the iron and steel industry have been almost entirely lacking during the first several weeks of the new year. The general condition of the market is practically unaltered; sentiment and expectancy are favorable, but actual improvement is slow. Some steel makers who had anticipated a sharp turn for the better after the first of the year, are inclined to be somewhat disappointed, although it is appreciated that it is quite early to draw conclusions.

It is becoming evident that some factor, generally believed now to be the tariff, is likely to have a deterrent effect upon the motion of the industry toward a normal basis. The usual expectation is that the new tariff bill will not be framed or enacted before June or July and that the market will be obliged to undergo this element of uncertainty throughout the first half. It is hoped that even the probability of a radical revision will be discounted by the trade long before final legislative action, but the buying public appears slow to make up its mind upon this question.

The attitude of the railroads in lending little support to consumptive demand by reason of their own difficulties, is changing very slowly for the better. Some evidence for encouragement is presented this week in the application to the mills by the New York Central lines for 80,000 tons of steel rails for 1909 delivery. This action is virtually equivalent to the placing of the contract, as the specifications governing the manufacture of the rails have been agreed upon between the railroad and the makers. The New York Central is the third line to place a large rail order covering this year's requirements, the others being the Pennsylvania and the Chicago, Burlington & Quincy. The Pennsylvania lines this week began to specify against their contract for 135,500 tons and it is anticipated that the full tonnage will be rolled by the mills during the present winter.

Pig Iron.—Few sales and a light inquiry continue to represent the pig iron market. In strength the situation shows practically no change. The increase of production by additional furnaces going into blast is not viewed with assurance by makers in view of the indefinite conditions.

While reports of weakness in foundry iron are current, there are no confirmatory sales and transactions under the general level have been found to be in off grades. The market appears well settled to a minimum of $15.50 valley and this price is by no means the rule, as many interests are asking higher figures. A sale of 500 tons of No. 2 for first quarter at $16 furnace is reported. A small tonnage of No. 1 went at $16.50 furnace. Upon an eastern inquiry for 3,000 tons of forge, $15 furnace was quoted.

A steel company of this district has an inquiry out for 1,000 tons of Bessemer monthly over the first half, but it is not likely that this purchase will be made as the interest has a regular source of supply for its material. There is a little activity in malleable and the market is quoted at from $15.90 to $16.25 valley. A car wheel maker in this territory has been buying considerable special analysis basic for first half at $16 valley. A local steel company took 500 tons of low phosphorus iron for first quarter at about $21.50 delivered. On prompt and first quarter shipment on northern iron, we quote as follows:

Bessemer, valley	$16.50 to 17.00
Bessemer, Pittsburg	17.40 to 17.90
No. 1 foundry, Pittsburg	16.90 to 17.40
No. 2 foundry, Pittsburg	16.25 to 16.90
Gray forge, Pittsburg	15.40 to 15.90
Basic, valley	15.75 to 16.00
Basic, Pittsburg	16.65 to 16.90

Ferro-Alloys.—Some activity in ferro-manganese in small lots is noted, and prices are firm. We quote 80 per cent ferro-manganese at $44 to $45 seaboard with a freight rate of $1.95 to Pittsburg, the lower quotation applying to prompt delivery. There is small demand for lower grades of ferro-silicon. We note a sale of 50 tons of 50 per cent ferro-silicon at about $63 Pittsburg.

Imported 50 per cent ferro-silicon is quoted at $63 to $63.50 Pittsburg on forward deliveries; domestic 12 per cent, $27.50; 11 per cent, $26.50; 10 per cent, $25.50 Pittsburg.

Plates.—Reports are current that the Pennsylvania railroad is considering the purchase of a great block of freight cars for its various lines, but the undertaking has not yet reached the market. The company is now getting figures on two miscellaneous lots of 500 and 600 cars respectively, which will likely be of all steel construction. If the reported contracts are placed, they will divert a large tonnage of plates to the steel mills. The Northern Pacific railroad is about to close on 200 box cars. The plate market is moving evenly and specifications are fair. The Carnegie Steel Co. has received orders to proceed with the 15,000 tons of plates required with the Brooklyn water works improvement, and the rolling of this tonnage will start shortly at the Homestead works. Shading on the light gages continues. We quote official prices:

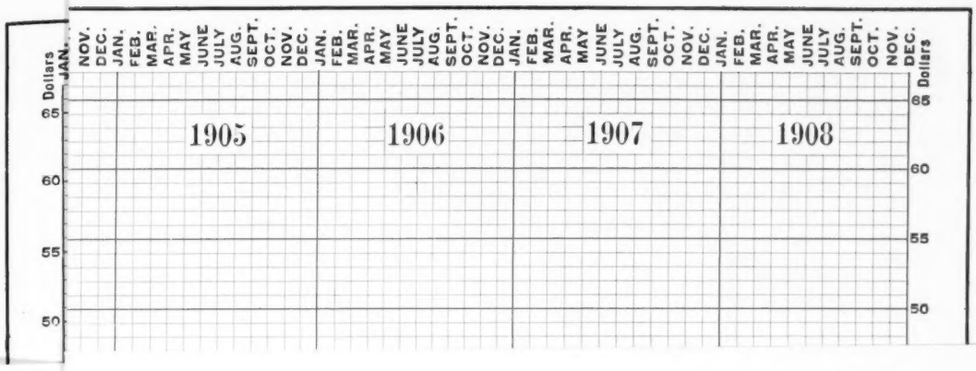
Tank plate, ¼-inch thick, 6¼ to 100 inches, 1.60c f. o. b. mill Pittsburg. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½-inch to and including 3/16-inch plate on thin edges, 0.10c; under 3/16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—Mill orders in sheets are slightly increasing and the market has shown a better tone in the past several weeks. The consumptive demand is from the general manufacturing and jobbing trade, but the orders of the latter for stocking purposes are light. Caution in filing orders is still apparent. The independent mills have resumed operations after the holiday cessation upon practically the same basis as before the shut-down. The American Sheet & Tin Plate Co. this week is operating 118 mills or 63 per cent of capacity, which is the best record of activity of the company for a number of months. Five additional mills were started this week at the Aetna-Standard works, Bridgeport, O. There is some shading of sheet prices. We quote officially as follows:

Blue annealed sheets, No. 10 and heavier, 1.80c; Nos. 11 and 12, 1.85c;

GENERAL LIBRARY,
UNIV. OF MICH.
JAN 14 1909

FOR FOURTEEN YEARS.



rolled at the Edgar Thomson works. It is expected that the entire order will be specified so that the mills may complete the rolling this winter. The Pittsburg & Lake Erie, and Baltimore & Ohio contracts, which are expected soon, have not been placed. Some small orders in standards are being regularly booked by the Carnegie Steel Co. The light rail market is active with a good demand from the lumber, mining and other buyers. Orders taken by the Carnegie Steel Co. in the past week were about 1,400 tons. Competition between

forcing steel bars, for which there has been a consistent demand, are moving less actively at this season. Re-rollers continue as aggressive for business in the several specialties, but are more cautious in making price concessions and in taking business for extended shipment. Shafting is irregular. We quote officially as follows:

Common iron bars, 1.50c Pittsburg in carload lots and over; 1.55c in less than carloads, 1.32c to 1.35c, base Pittsburg, plus freight to point of shipment on western deliveries; Bes-

ppen-hearth steel bars, d cultivator, 1.40c; chan- zees, tees, under three all f. o. b. Pittsburg. differentials are main- eel: Less than 2,000 advance; less than 1,000 ize, 0.30c advance. Cold und shafting, 57 per cent nd 52 per cent in less delivered in base terri- arth spring steel, 2.25c gh shoe flats, 1.60c to h finished machinery 2c; toe calk, 2.10c to ed and machine straight- is 1.60c base. Iron fin- der 1½ by ¼ inches, extra on tire card; iron ½ by ½ and over, 1.40c, n the steel bar card. ed strip steel, width 1½ der, and 0.100 inch and ote base prices for 100 on hard, and $3.60 on

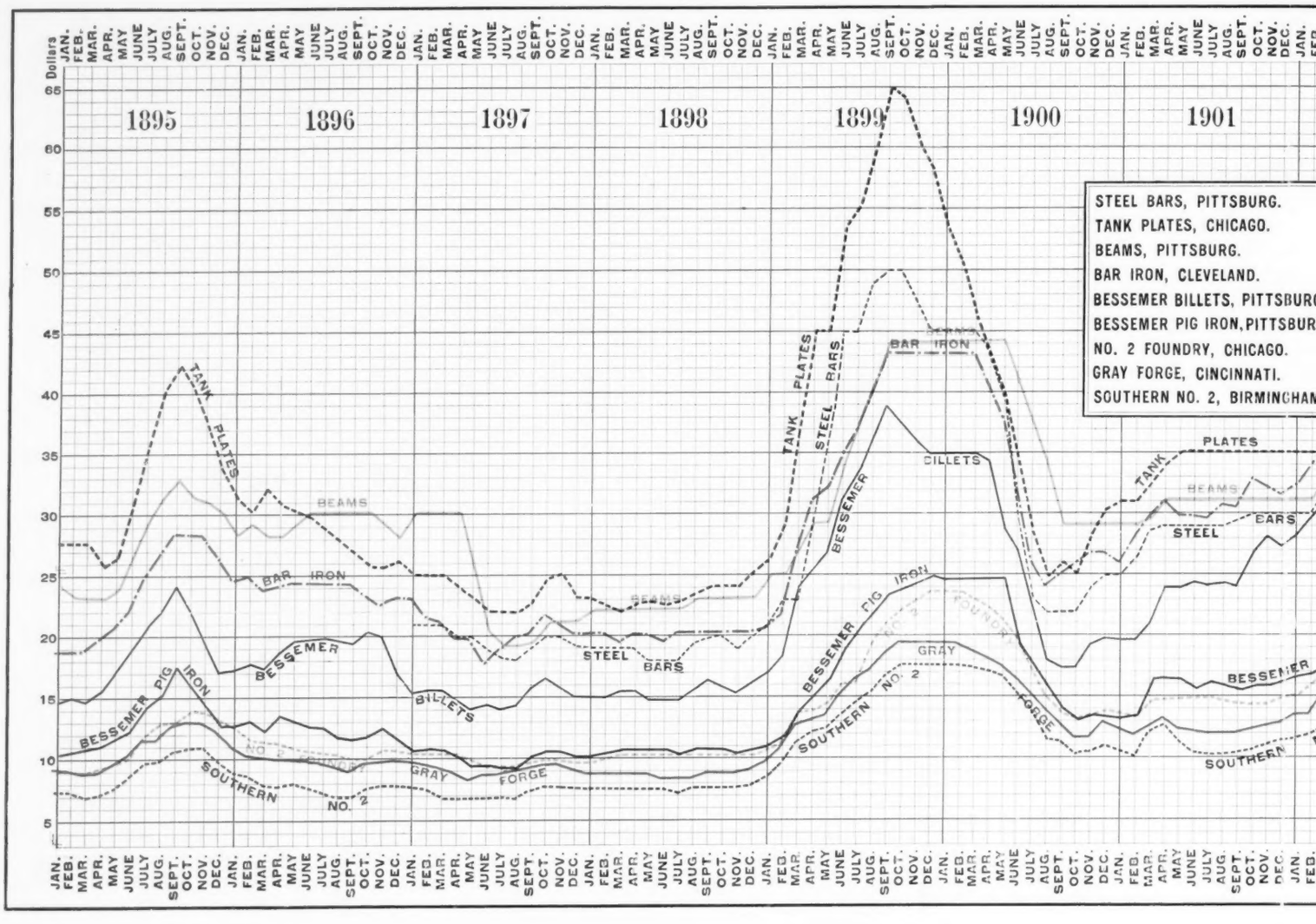
aterial.—Fabricators and figuring upon a great largely of the smaller ntracts placed are still ber. Fabricating prices ular. A fair run of ning to the structural ent in this week on a ing for the T. C. Jen- ttsburg. The height of undetermined and esti- en taken on from five which will require from ns, respectively. The el Co. is taking figures nt at Brackenridge, Pa., s. The Jones & Laugh- as taken 1,300 tons for n Baltimore. W. W. n, O., has been awarded ntract for the construc- nt of H. B. Clow & , O., which will require quote officially as fol-

channels, 15-inch and over 15 inches, 1.70c; zees, 1.60c; tees, 1.65c; angles from 3 to 6 inches, 1.60c; over 6 inches, 1.70c; universal and sheared plates, 6¼ inches and wider, 1.60c base.

Merchant Pipe.—A gas company has closed for a number of miles of 6-inch line pipe for a gas line in Louisiana and Texas. The market continues only moderately active, but there is considerable business in prospect and makers are anticipating favorable trade within a reasonable period. The jobbers are taking little stock. Prices are being well maintained. We quote the following official base discounts,

THE IRON TRA

CHART SHOWING FLUCTUATIONS IN IRON A



AVERAGE MONTHLY PRICES OF IRON

(FINISHED PRODUCTS IN NET TONS. PIG I

	1899												1900											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
No. 2 Foundry Chicago..	$11.25	12.00	14.25	15.00	15.25	17.00	17.00	20.00	22.00	23.00	23.50	24.50	$24.50	24.25	23.75	23.25	22.00	20.25	17.75	15.50	14.50	14.00	14.25	14.60
Gray Forge Cincinnati...	$ 9.50	10.50	12.75	13.00	13.25	15.00	16.25	17.00	18.50	19.25	19.25	19.25	$19.25	19.25	18.75	18.40	17.75	16.25	15.25	12.90	12.00	11.75	11.75	12.75
Plates Chicago.....	$23.50	29.50	39.00	45.00	45.00	53.50	55.50	60.50	65.00	64.00	60.00	58.00	$52.50	50.00	45.25	42.00	38.75	32.75	28.00	25.00	26.00	25.00	29.25	30.75
Billets (Bess.) Pittsburg..	$16.75	18.25	24.00	25.50	27.00	31.50	33.50	36.50	39.00	37.50	36.00	35.00	$35.00	35.00	35.00	34.50	29.00	27.25	22.50	18.00	17.50	17.50	19.30	19.75
Bessemer Pig Pittsburg..	$11.00	11.75	14.00	15.15	16.25	19.00	20.75	22.00	23.50	24.05	24.50	25.00	$24.90	24.90	24.90	24.90	24.90	19.75	18.00	16.05	14.00	13.25	13.65	13.55
Beams Pittsburg.....	$26.00	26.00	28.00	30.00	30.00	35.00	38.75	41.25	45.00	45.00	45.00	45.00	$45.00	45.00	45.00	45.00	45.00	41.50	38.00	34.80	30.00	30.00	30.00	30.00
Bar Iron Cleveland.....	$20.50	21.75	27.50	31.00	32.00	34.75	36.75	39.75	43.00	43.00	43.00	43.00	$43.00	43.00	43.00	40.50	37	25	33	00	26.00	24.00	25.00	26.00	26.75	26.75

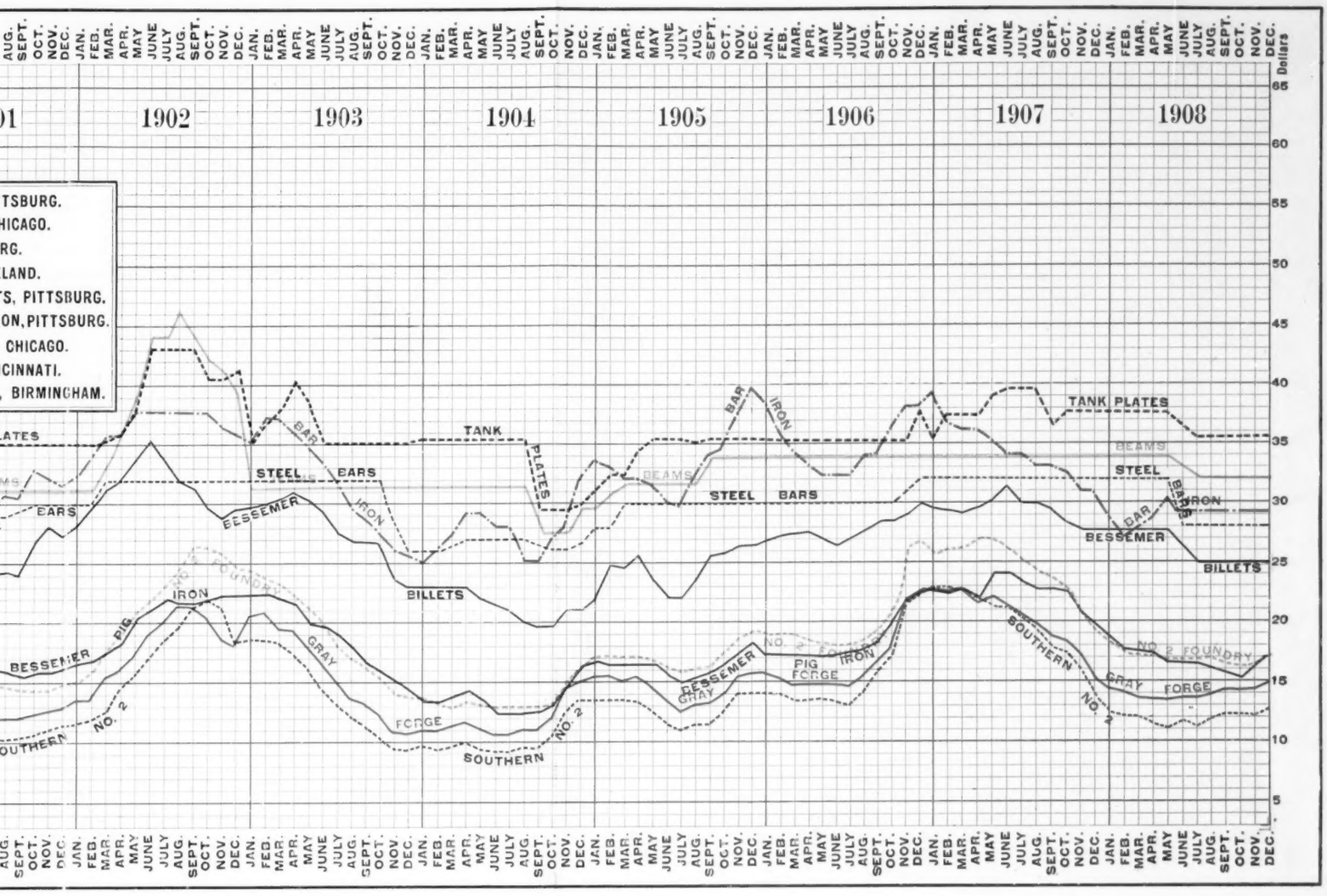
	1904												1905											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
No 2 Foundry Chicago...	$14.10	13.75	13.55	14.00	13.80	13.40	13.30	13.35	13.40	13.70	15.60	16.60	$17.50	17.50	17.50	17.50	17.25	16.60	16.15	16.35	16.50	17.55	18.90	19.50
Gray Forge Cincinnati...	$11.00	11.00	11.25	11.75	11.25	10.75	10.75	11.00	11.00	11.75	14.25	15.00	$15.25	15.20	15.00	15.20	14.81	13.35	12.28	13.00	13.00	13.88	15.35	15.75
Plates Chicago.....	$35.30	35.30	35.30	35.30	35.30	35.30	35.30	35.30	29.30	29.30	29.30	30.10	$31.30	32.30	32.30	34.80	35.30	35.30	35.30	35.30	35.30	35.30	35.30	35.30
Billets (Bess.) Pittsburg..	$23.00	23.00	23.00	23.00	22.00	21.50	21.00	20.00	19.50	19.50	21.00	21.00	$21.00	24.90	24.60	25.50	23.50	22.00	22.00	23.50	25.77	25.95	26.30	28.50
Bessemer Pig Pittsburg..	$13.60	13.35	13.85	14.10	13.60	12.60	12.50	12.65	12.75	13.35	15.25	16.60	$16.85	16.45	16.35	16.30	16.20	15.65	15.00	15.40	15.90	16.50	17.70	18.10
Beams Pittsburg.....	$32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	28.00	28.00	28.00	30.00	$30.00	31.00	32.00	32.00	32.00	32.00	32.00	32.00	34.00	34.00	34.00	34.00
Bar Iron Cleveland.....	$25.00	26.00	27.00	29.00	29.00	28.00	28.00	25.00	25.00	27.00	28.00	32.00	$33.25	33.00	32.00	32.00	31.50	30.00	29.75	32.00	34.00	34.25	37.20	40.00
No. 2 Fd'ry Birmingham.	$ 9.75	9.50	9.70	10.00	9.65	9.15	9.15	9.50	9.50	10.65	12.75	13.50	$13.50	13	50	13.50	13.25	12.75	11.85	11.00	11.65	11.75	12.50	14.00	14.00	41.00

SUPPLEMENT TO
THE IRON TRADE REVIEW
JAN. 14, 1909.

GENERAL LIBRARY,
UNIV. OF MICH.
JAN 14 1909

TRADE REVIEW

ON AND STEEL PRICES FOR FOURTEEN YEARS.



IRON AND STEEL PRODUCTS, 1899-1908.

ET TONS. PIG IRON AND BILLETS IN GROSS TONS.)

1901												
Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
12	15.19	15.50	15.50	15.50	15.50	15.20	15.00	15.00	15.00	15.50
87	12.56	13.12	12.60	12.25	12.00	12.00	12.00	12.25	12.69	13.00
.00	32.40	34.40	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
75	20.81	24.12	24.20	24.44	24.25	24.40	24.12	26.80	28.25	27.62
60	16.56	15.69	16.65	15.94	16.00	15.90	15.71	15.90	16.10	16.35
.00	30.40	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00
80	29.30	39.80	29.80	29.80	29.40	30.80	30.60	32.80	32.00	31.70

1902												
Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
$15.80	16.75	18.62	19.75	21.75	22.50	23.40	24.86	27.15	27.15	26.90	25.40
$13.75	13.75	15.25	16.00	17.05	18.93	20.00	21.50	21.50	20.60	18.87	18.00
$35.00	35.00	35.25	36.25	38.60	43.00	43.00	43.00	43.00	40.60	40.50	41.00
$28.06	29.81	31.37	32.25	33.90	35.18	33.50	32.12	31.50	29.80	29.00	29.25
$16.70	16.93	17.56	18.37	20.95	21.25	22.00	21.75	21.75	21.95	22.25	22.12
$32.00	32.00	34.00	37.00	40.00	45.00	45.00	47.00	45.00	43.00	42.00	40.00
$32.10	33.70	35.70	35.77	37.70	37.70	37.70	37.70	37.70	37.50	36.20	35.70

1903												
Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
$25.00	24.00	24.00	23.00	21.70	20.50	18.50	17.50	16.85	15.90	14.50	14.30
$20.50	20.75	19.35	19.20	17.70	16.50	14.60	13.50	13.25	12.30	10.95	10.75
$35.00	37.00	38.00	40.00	37.75	35.00	35.00	35.00	35.00	35.00	35.00	35.00
$29.75	30.00	30.00	30.25	31.00	30.50	29.50	27.50	27.00	27.00	26.50	23.50	23.00
$22.35	22.35	22.00	21.60	20.00	19.85	19.00	17.85	16.35	15.85	15.25	14.35
$35.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00
$32.00	37.00	37.00	36.00	35.00	33.75	22.00	30.00	29.00	28.00	26.00	25.50

1906												
Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
25	19.00	18.75	18.50	18.10	18.30	18.90	19.75	21.50	26.50	27.00
65	14.85	14.75	14.75	14.65	14.55	15.40	16.50	17.50	21.70	22 00
30	35.30	35.30	35.30	35.30	35.30	35.30	35.30	35.30	35.30	37.30
50	27.65	27.75	27.00	26.25	27.00	28.00	28.50	28.50	29.00	29.75
29	17.24	17.25	17.24	17.38	17.57	17.96	18.44	20.06	21.96	22.75
00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
50	34.00	33.00	32.00	32.00	32.00	33.50	34.00	36.00	39.00	39.00
00	13.70	13 65	13.75	13.50	13.00	14.15	16.00	17.15	21.25	22.00

1907												
Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
$26.00	26.50	26.75	27.50	27.40	26.50	25.40	24.50	23.60	22.60	20.60	19.00
$22.60	22.50	22.70	21.50	21.90	21.35	20.55	19.95	18.85	18.45	17.35	15.50
$35.30	37 30	37.30	37.30	39.40	39.60	39.60	39.60	36.60	37.60	37.60	37.60
$29.75	29.50	29.25	29.75	30.25	31.00	30.00	30.00	29.50	28.50	28.00	28.00
$22.92	22.78	22.85	22.16	24.10	24.10	23.30	22.90	22.90	22.80	20.60	19.90
$34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.05	34.00
$39.00	36.50	36.00	36.00	35.00	34 00	34.00	33.00	33.00	32.50	31.00	31.00
$23.00	23.00	22.75	22.00	21.40	21.25	20.50	19.80	18.12	17.65	16.00	14.91

1908												
Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
$18.24	17.87	17.42	17.21	17.00	17.31	17.00	17.00	16.75	16.50	16.75	17.35
$14.45	14.06	13.63	13.60	13.59	13 75	13.70	14 00	14.25	14.25	14 25	14 75
$37.60	37.60	37.60	37.60	37.60	36 60	35 60	35 60	35.60	35.60	35 60	35 60
$28.00	28.00	28.00	28.00	28.00	2 : 50	25.00	25 00	25.00	25 00	25 00	25.00
$19.00	1 .90	17.86	17.49	16.92	16.90	16.73	16.11	15.90	15.48	16-74	17 40
$34.00	34.00	34.00	34.00	34.00	33 00	32.00	32 00	32.00	32.00	32.00	32.00
$28.80	27.00	28.00	28.40	30.00	29 00	29.00	29 00	29.00	29.00	29 00	29.00
$12 80	12 50	12.12	11.90	11.50	12.00	11 60	12.06	12.50	12.50	12 50	13.00

THE WEEK IN IRON CENTERS

PITTSBURG.

New York Central I
in Coke—Few P

Office of THE
51

Progressive devel
iron and steel indus
most entirely lackin
several weeks of th
general condition
practically unaltere
expectancy are fav
improvement is sl
makers who had a
turn for the bette
of the year, are inc
what disappointed,
preciated that it i
draw conclusions.

It is becoming e
factor, generally be
the tariff, is likely t
effect upon the moti
toward a normal
expectation is that
will not be framed
June or July and th
be obliged to und
of uncertainty thr
half. It is hoped t
ability of a radical
discounted by the
final legislative act
public appears slow
mind upon this q

The attitude of
lending little suppo
demand by reason
culties, is changing
the better. Some
couragement is pr
in the application
the New York Cent
tons of steel rails
This action is virt
the placing of the
specifications gover
ture of the rails ha
on between the rail
ers. The New Y
third line to place
covering this year's
others being the P
Chicago, Burlingto
Pennsylvania lines
to specify against
135,500 tons and it is anticipated that the full tonnage will be rolled by the mills during the present winter.

Pig Iron.—Few sales and a light inquiry continue to represent the pig iron market. In strength the situation shows practically no change. The increase of production by additional furnaces going into blast is not viewed

per cent, $23.50 Pittsburg.

Plates.—Reports are current that the Pennsylvania railroad is considering the purchase of a great block of freight cars for its various lines, but the undertaking has not yet reached the market. The company is now getting figures on two miscellaneous lots of 500 and 600 cars respectively, which will likely be of all steel construction. If

additional mills will be shut down at the Aetna-Standard works, Bridgeport, O. There is some shading of sheet prices. We quote officially as follows:

Blue annealed sheets, No. 10 and heavier, 1.80c; Nos. 11 and 12, 1.85c;

Nos. 13 and 14, 1.90c; Nos. 15 and 16, 2c; box annealed, Nos. 17 to 21, 2.25c; Nos. 22 to 24, 2.30c; Nos. 25 and 26, 2.35c; No. 27, 2.40c; No. 28, 2.40c; No. 29, 2.60c; No. 30, 2.70c; galvanized sheets, Nos. 10 and 11, 2.45c; Nos. 12 and 14, 2.55c; Nos. 15 and 16, 2.65c; Nos. 17 to 21, 2.80c; Nos. 22 and 24, 2.95c; Nos. 25 and 26, 3.15c; No. 27, 3.35c; No. 28, 3.55c; No. 29, 3.70c; No. 30, 2.95c; corrugated roofing, $1.75 per square for No. 28 painted, 2½-inch corrugation, and $3.10 per square on galvanized roofing, 2½-inch corrugation. No. 28.

Jobbers are allowed $1 a ton from these prices.

Tin Plate.—A good run of specifications is being received from the fish packers of the Pacific coast and from the canning interests which are preparing for the early fruit crops. These specifications, together with the anticipated shipments that will go forward over the first quarter, are affording the mills better operating schedules. The leading maker of tin plate, this week started in full its American works of 28 mills at Elwood, Ind., and has active 160 mills or 66 per cent of its total capacity. This is the highest mark reached by the company's operations for some time. We quote officially:

Coke tin plate, 100-pound basis, 14 x 20, $3.70 f. o. b. mill Pittsburg district. Terms, 30 days, less 2 per cent for cash in 10 days.

Rails and Track Material.—The New York Central railroad has filed its inquiry with the mills for 80,000 tons of steel rails for 1909 delivery. While the specifications are somewhat different from those of other steam roads, the rail mills have agreed to accept them and there are no further obstacles before the formal placing of the contract. It is expected that the distribution of the order among the several mills will be announced soon. The Pennsylvania Railroad Co. has filed its first specifications against its recent contract for 135,500 tons. Part of the order is for prompt shipment, the portion coming to the Carnegie Steel Co. now being rolled at the Edgar Thomson works. It is expected that the entire order will be specified so that the mills may complete the rolling this winter. The Pittsburg & Lake Erie, and Baltimore & Ohio contracts, which are expected soon, have not been placed. Some small orders in standards are being regularly booked by the Carnegie Steel Co. The light rail market is active with a good demand from the lumber, mining and other buyers. Orders taken by the Carnegie Steel Co. in the past week were about 1,400 tons. Competition between the mills rolling from billets and rerollers is keen in the territory where the latter mills are active. Considerable spike business is still under negotiation. On present specifications on Bessemer rails we quote as follows, the base price for open-hearth rails being $30 mill.

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; 8-pound, $32; 12-pound, $29; 16-pound, $27; 20-pound, $26; 25 to 45-pound, $25; angle splice bars for standard sections, $1.65; standard spikes, $1.70 to $1.80 Pittsburg; hand spikes, $1.80 to $1.90 Pittsburg.

Steel.—Some billet makers are not aggressively soliciting new business, but are devoting their attention to obtaining specifications against present contracts. These orders are increasing. Some small lots in new business are being taken. Prices are reported to be well upheld. Sheet bar specifications are in larger volume because of the greater activity of the sheet and tin mills. New business is light in small tonnages.

Bessemer and open-hearth billets, base sizes, are quoted at $25 Pittsburg, and forging billets at $27 Pittsburg, subject to the division of the freight charge over $1 and not exceeding $2, and sheet and tin bars at $27.50 Pittsburg, valley and Wheeling territory, and $27 Pittsburg for delivery to other points.

Hoops and Bands.—Considerable unspecified tonnage on makers' books has been carried into the new year, and new business as a consequence is very moderate. Few contracts for extended shipment are being placed. Shading of prices in this market is encountered. We quote official prices:

Hoops in carload lots, 1.80c; in less than carload lots, 1.90c; bands, 1.40c, base half extras as per standard steel.

Merchant Bars.—Both the iron and steel bar markets are quiet, although the latter continues to show moderate improvement. Orders so far this month have not been heavy. Bar iron prices are holding quite firm. Reinforcing steel bars, for which there has been a consistent demand, are moving less actively at this season. Re-rollers continue as aggressive for business in the several specialties, but are more cautious in making price concessions and in taking business for extended shipment. Shafting is irregular. We quote officially as follows:

Common iron bars, 1.50c Pittsburg in carload lots and over; 1.55c in less than carloads, 1.32c to 1.35c, base Pittsburg, plus freight to point of shipment on western deliveries; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator, 1.40c; channels, angles, zees, tees, under three inch, 1.50c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 57 per cent in carloads, and 52 per cent in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. Planished and machine straightened tire steel is 1.60c base. Iron finished tire under 1½ by ½ inches, 1.55c, plus ½ extra on tire card; iron finished tire, 1½ by ½ and over, 1.40c, plus ½ extra on the steel bar card.

On cold rolled strip steel, width 1½ inches and wider, and 0.100 inch and thicker, we quote base prices for 100 pounds, $3.35 on hard, and $3.60 on soft.

Structural Material.—Fabricators and erectors are figuring upon a great many projects, largely of the smaller order, but contracts placed are still limited in number. Fabricating prices continue irregular. A fair run of orders is coming to the structural mills. Bids went in this week on a proposed building for the T. C. Jenkins estate, Pittsburg. The height of the building is undetermined and estimates have been taken on from five to 12 stories, which will require from 200 to 700 tons, respectively. The West Penn Steel Co. is taking figures for its new plant at Brackenridge, Pa., about 1,000 tons. The Jones & Laughlin Steel Co. has taken 1,300 tons for a warehouse in Baltimore. W. W. Luyster, Dayton, O., has been awarded the general contract for the construction of the plant of H. B. Clow & Son, Coshocton, O., which will require 440 tons. We quote officially as follows:

Beams and channels, 15-inch and under, 1.60c; over 15 inches, 1.70c; zees, 1.60c; tees, 1.65c; angles from 3 to 6 inches, 1.60c; over 6 inches, 1.70c; universal and sheared plates, 6¼ inches and wider, 1.60c base.

Merchant Pipe.—A gas company has closed for a number of miles of 6-inch line pipe for a gas line in Louisiana and Texas. The market continues only moderately active, but there is considerable business in prospect and makers are anticipating favorable trade within a reasonable period. The jobbers are taking little stock. Prices are being well maintained. We quote the following official base discounts,

subject to five off to jobbers, while a few of the very largest jobbers with mill connections are given an additional one point off:

	—Steel—		—Iron—	
	Black.	Galv.	Black.	Galv.
¼ to 6 inches....	75	65	73	63

Boiler Tubes.—The continued light construction of power in the country is keeping the boiler tube market rather dull. The railroads are still comparatively small buyers. We quote the following official base discounts to the general trade on base sizes:

BOILER TUBES.

	Iron.	Steel.
2¼ to 5 inches.....	52	65

Wire Products.—The general condition of the market shows no change, and while it is apparent that the uncertainty over the tariff is having considerable effect on buying, the prospects are good. The present season is normally quiet. We quote official prices as follows:

Wire nails, jobbers' carload lots, $1.95; retailers' carload lots, $2; painted barb wire, jobbers' carload lots, $2.10; retailers' carload lots, $2.15, with 30c for galvanizing; plain wire to jobbers in carloads, 1.80c; and to retailers in calroads, 1.85c.

Wire Rods.—Some rod consumers are showing a reluctance to cover for their requirements very far into the future. There is little new business. We quote $33 Pittsburg on Bessemer and $34 Pittsburg on open-hearth rods.

Coke.—Efforts are being made by independent operators to restrict the production of furnace coke, as an over supply of this grade is believed to have been the cause for the recent weakness in the spot market. Under the belief that the consumptive demand would be increased about the first of the year by additional furnaces going into blast, a number of idle ovens were fired. The expectation of increased furnace demand was not fulfilled, resulting in excessive offerings of prompt coke. Some of the operators also declined to accept the current prices and held for advances. At present a number of the plants are being banked one or two days weekly, while others are closed down entirely until much of the spot coke has been absorbed. A number of the independent operators are attempting to maintain a $1.75 oven price on spot coke. We quote this market at from $1.65 to $1.75 ovens, and on contract from $1.90 to $2 ovens. A great majority of the foundry consumers are covered over the first half, and contracting is light. We quote standard Connellsville foundry coke at from $2.15 to $2.25 ovens for immediate shipment and on contract from $2.25 to $2.50 ovens. The figures of the *Courier* for the week ending Jan. 2 show the largely increased production in the Connellsville regions, the output being 252,058 tons from 22,556 active ovens, compared with 207,853 tons and 22,477 active ovens the previous week.

Old Material.—In some grades there is a freer offering of old material and a tendency toward weakness. Heavy steel is not so closely held, although prices have undergone no change. The embargo upon the plant of the Allegheny Steel Co. has been lifted, but borings are softer, the increased available supply having exceeded the demands of the dealers covering on their short contracts. Some sliding scale contracts with producers are being closed by consumers of low phosphorus scrap, and a fixed differential over the Pittsburg selling price of Bessemer iron is the basis of settlement used. The Pennsylvania lines east are offering their usual accumulation of shop material, but the rail tonnage is lighter than usual. We quote gross tons delivered in the Pittsburg district as follows:

Heavy melting scrap, $16.25 to $16.75; re-rolling rails, $17.25 to $17.75; bundled sheet scrap, $14.50 to $15; iron axles, $23.50 to $24; old iron rails, $18.50 to $19; No. 1 wrought scrap, $17.50 to $18; old car wheels, $16.50 to $17; low phosphorus, $18.50 to $19; machine shop turnings, $12.75 to $13.25; cast borings, $10.50 to $11; No. 1 cast scrap, $14.75 to $15; malleable, $14.50 to $15.

CLEVELAND.

Labor Interests and the Open Shop—Pig Iron Dull.

Office of THE IRON TRADE REVIEW, Browning Building, Jan. 12.

Iron Ore.—Leading vessel interests have been busy making arrangements with their engineers on an open shop basis. A large majority of the engineers and second engineers of the Pittsburg Steamship Co. and Pickands, Mather & Co. have signed individual contracts for next year. Seventeen members of the engineers' union have been charged with violating the laws of the union, but only three appeared for trial. The union is showing a disposition to exclude from its deliberations all who signed contracts on the open shop basis, and the dissolution of the union, or at least its decided weakening, seems to be imminent. Some of the independent interests are not taking any steps at the present time to obtain contracts from their engineers, but are awaiting developments. Several signed contracts have been returned to local vessel men.

With the exception of the sale of 6,000 tons of hard ore, the market has been featureless, and furnace owners continue to show no interest in the ore market.

On base ores with the guarantee of 45 per cent on old range and Mesabi Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; and Mesabi non-Bessemer, $3.50.

Pig Iron.—There is only moderate inquiry and sales are few. Reports of concessions in the valleys are current, but there is no weakness in the Cleveland district, as furnaces are well sold up and are not all disposed to make concessions. The inquiry for 6,000 tons of basic reported last week was evidently a feeler sent out by a concern in Erie which contemplates the building of a steel plant. Although there have been some holdups on account of inventory taking, deliveries have been made fairly well on pig iron. We quote delivered in Cleveland on spot iron as follows:

No. 1 foundry	17.25 to 17.50
No. 2 foundry	16.75 to 17.00
No. 3 foundry	16.25 to 16.50
No. 2 southern	17.35
Gray forge	14.75 to 15.25
Bessemer	$17.40 to 17.90
Lake Superior charcoal	19.50 to 20.00
Jackson Co. 8 per cent silvery..	20.05

Coke.—The market is not strong and furnace coke can be had on contracts as low as $1.85, although the usual price is $1.90 to $2. On standard foundry coke on contracts, the price is from $2.25 to $2.35. Furnace coke is sold at $1.55 to $1.70 for prompt delivery, and spot foundry coke at $2 to $2.25.

Finished Material.—Mills continue to report very satisfactory specifications on contracts, but new business is at low ebb. On sheets there is less cutting, although it occasionally appears. Bar iron is irregular and Cleveland mills are having trouble in getting enough orders to keep in operation.

Old Material.—Unmistakable softening of the market in everything except heavy melting steel is very apparent; but no local sales have been made in a sufficient quantity to warrant a change in last week's price quotations. In some quarters, it is declared that the quoted prices on busheling can be shaded $1.50 a ton. The declaration of another embargo on turnings in the Pittsburg district would not be surprising to Cleveland sellers. We continue to quote f. o. b. Cleveland as follows:

Old iron rails	$19.00 to 19.50
Old steel rails (re-rolling)	16.50 to 17.00
Old steel rails (under 6 ft.)	16.50 to 17.00
Old car wheels	15.50 to 16.00
Old steel boiler plate	13.50 to 14.00
Steel axles	20.00 to 20.50
Malleable iron (railroad)	15.00 to 15.50
Malleable iron (agricultural)	13.50 to 14.00
Heavy steel	15.50 to 16.00
Country mixed steel	13.50 to 14.00
Low phosphorus	17.00 to 17.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$15.50 to 16.00
No. 1 busheling	13.50 to 14.00
No. 1 machine cast	13.50 to 14.00
Iron axles	19.00 to 19.50
Axle turnings	11.00 to 11.50
Machine shop turnings	10.00 to 10.50
Grate bars	12.00 to 12.50
Pipes and flues	12.50 to 13.00
Tank iron	12.50 to 13.00
Hoop and band iron	9.25 to 9.75
Sheet iron	8.50 to 9.00
Wrought drillings	10.00 to 10.50
Stove plate	12.50 to 13.00
Cast borings	8.50 to 9.00

CINCINNATI.

Large Sale to an Eastern Cast Iron Pipe Manufacturer.

Office of THE IRON TRADE REVIEW, First National Bank Bldg., Jan. 12.

Pig Iron.—The transactions in pig iron through this market during the past week have been moderate. The inquiry of the leading interests in cast iron pipe, which it was expected would be likely to result in a liberal tonnage, resulted in the purchase of only a small quantity so far as can be learned and we hear of only 1,000 tons being placed with Cincinnati agencies. The most notable sale of southern iron is the purchase of 20,000 tons by an eastern cast iron pipe manufacturer, the tonnage to be taken at the rate of 200 tons a day for 100 days. Inquiry is fairly active. A northern Ohio pipe manufacturer is in the market for 9,000 tons, to be delivered at the rate of 1,500 tons per month for the next six months. The Republic Iron & Steel Co. wants 1,500 tons of gray forge for its Youngstown plant. An Indiana consumer asks for prices on 500 to 1,000 tons of foundry iron. An Indianapolis melter inquires for 1,000 tons of malleable, and a large Ohio concern wants 500 tons of northern and 500 tons of southern iron for first half delivery. A large manufacturer of pumps asks for quotations on 750 tons of foundry iron. The price situation is apparently unchanged and southern pig iron continues to be quotable at $13 Birmingham, with northern iron at $15.50 at furnace for No. 2 foundry. The low grades continue in limited supply and are rather firmly held, but $11.50 Birmingham can be done on a moderate tonnage. Consumers continue to take deliveries on contracts quite satisfactorily. The call for spot iron is light, as consumers seem to be fairly well supplied and covered by contracts. There is enough inquiry for small tonnages, in addition to the important and larger amounts mentioned in the market to keep furnaces firm in their views. A change is noted in the grading and prices of high silicon iron in the Jackson county district, full details of which are given in another column. We quote for prompt shipment and delivery over the first quarter, delivered Cincinnati, based on freight rates of $3.25 from Birmingham and $1.10 from Ironton, as follows:

Southern foundry No. 1	$16.75 to 17.25
Southern foundry No. 2	16.25 to 16.75
Southern foundry No. 3	15.75 to 16.25
Southern foundry No. 4	15.25 to 15.75
Southern No. 1 soft	16.75 to 17.25
Southern No. 2 soft	16.25 to 16.75
Southern gray forge	14.75 to 15.25
Northern No. 1 foundry	17.10 to 17.60
Northern No. 2 foundry	16.60 to 17.10
Northern No. 3 foundry	16.10 to 16.60
Northern 8 per cent silicon	19.60

Finished Material.—Specifications on contracts have been rather moderate the past week and jobbers report trade from the stores rather quiet. Mill order business is light. Small orders for finished product are filled here at the following quotations:

Iron and steel bars, 1.85c to 2c, full extras. Angles 3 x 3 and over, 2.10c to 2.25c; beams and channels, 15 inches and under, 2.10c to 2.25c; small angles and architectural channels, 2c base; plates, ¼-inch and heavier, 2c; 3/16-inch, 2.10c; No. 8, 2.15c; sheets, blue annealed, No. 10, 2.15c to 2.25c; No. 12, 2.20c to 2.30c; No. 14, 2.25c to 2.35c; No. 16, 2.35c to 2.45c; box annealed sheets, Nos. 18 and 20, 2.55c to 2.65c; Nos. 22 and 24, 2.65c to 2.75c; Nos. 25 and 26, 2.70c to 2.80c; No. 27, 2.75c to 2.85c, and No. 28, 2.85c to 2.95c; boiler tubes, 2¾ to 5 inches, 62 per cent off base; turnbuckles, 45 per cent off; rivets, 3c base; cold and rolled shafting, 47 to 50 per cent off list; steel tire, 2.05c to 2.10c base.

Coke.—The offerings of prompt shipment foundry coke continue rather free and the market is easy. The ovens accumulated a little stock during the holidays, which they have not yet been able to work off, which has resulted in a weakening of prices for immediate shipment. Prompt shipment furnace coke is also rather freely offered and rules easy. There is but little contracting being done, but contract prices are unchanged. Spot coke is obtainable at from 35 to 50 cents per ton less than the contract prices. The ovens are asking the following figures for forward delivery:

	PER TON.
Wise county furnace coke	$1.90
Wise county foundry coke	2.25 to 2.35
Pocahontas furnace coke	1.85 to 2.00
Pocahontas foundry coke	2.00 to 2.25
Standard Connellsville furnace coke	2.00 to 2.25
Standard Connellsville foundry coke	2.35 to 2.50

Old Material.—Quotations are unchanged, as dealers continue to demand strong prices and are holding their stocks firmly. Dealers' prices here are as follows:

Old No. 1 R. R. wrought, net tons	$14.50 to 15.00
No. 1 machinery, net tons	13.50 to 14.00
Old iron rails, gross tons	18.00 to 18.50
Old steel rails (re-rolling) gross tons	16.50 to 17.00
Old short lengths, gross tons	16.50 to 17.00
Old iron axles, net tons	17.00 to 18.00
Heavy melting scrap, gross tons	14.50 to 15.50
Stove plate, net tons	11.00 to 11.50
Wrought turnings	8.00 to 8.50
Cast borings, net tons	6.00 to 7.00
Car wheels, gross tons	15.50 to 16.00

PHILADELPHIA.

Pig Iron Buyers Willing to Contract at Concessions, but Furnaces Firm.

Office of THE IRON TRADE REVIEW, 408 Central Trust Bldg., Jan. 12.

Pig Iron.—The market presents about the same features as a week ago, in that two or three large melters of pipe irons and at least one basic consumer are willing to take on important tonnages at concessions from current figures, while furnaces are possibly even more firm in their ideas of prices. In the case of basic, the current inquirer is now willing to pay the figure at which it was freely offered iron a month ago, and the pipe manufacturers seemingly have also overstayed the market. One of the latter has secured a small tonnage of southern iron at about a $12.50 Birmingham basis, but this was a resale transaction and is not indicative of the market. One sale of 3,000 tons of puddle iron at full prices is reported, and there is the usual volume of small transactions in foundry irons, chiefly for early shipments. No sales of low phosphorus or malleable iron are noted, and basic, in fact, is quiet so far as actual selling is concerned. We quote, eastern Pennsylvania delivery, first quarter, as follows:

No. 1X foundry	$17.50 to 18.00
No. 2X foundry	17.00 to 17.50
No. 2 plain	16.50 to 17.00
Standard gray forge	16.00 to 16.50
Basic	16.75 to 17.25
Low phosphorus	21.50 to 21.75
No. 2 Birmingham	17.75 to 18.25
No. 2X Virginia	17.50 to 18.00
No. 2 plain Virginia	17.00 to 17.50

Finished Materials.—Locally the market is still feeling the effect of holiday dullness, and current business is light. No new railroad business is reported and little is expected in the early future. It is now estimated that during 1908 less than 40 per cent of the country's steel rail capacity was operated. In structural lines the trade is awaiting a 1,500-ton high school in West Philadelphia, and the Curtis building is nearly ready to come out.

It is understood that the Belmont Iron Works will furnish the steel, under 300 tons, for the Wilmington filtration plant. In other lines the situation is unchanged and we quote: Structurals, 1.75c to 1.90c; plates, 1.75c to 1.80c; refined bar iron, 1.50c to 1.60c; steel bars, 1.55c.

Old Materials.—Wrought pipe is in good demand and prices are higher on rather brisk selling. Railroad offerings for the month are rather small and do not include anything unusual; it is noted that the large rail accumulations have been well cleaned out. The purchasing agents of the mills now endeavoring to hold heavy melting steel at $17, delivered, are to meet next Friday, but it is understood that two interests heretofore in this movement are now paying higher prices, as little scrap is to be had at this figure. The Worth purchase is about half delivered. We quote, gross tons, eastern Pennsylvania delivery, as follows:

Old steel rails (re-rolling)	$18.00 to 18.50
No. 1 steel scrap	17.25 to 17.75
Old steel axles	22.00 to 23.00
Old iron axles	25.00 to 26.00
Old iron rails	21.00 to 22.00
Old car wheels	16.00 to 16.50
Choice scrap R. R. No. 1 wrought	20.00 to 20.50
No. 1 yard scrap	18.00 to 18.50
Machinery scrap	16.00 to 16.50
Low phosphorus scrap	20.00 to 20.50
Wrought iron pipe	16.00 to 16.50
No. 1 forge fire scrap	15.00 to 15.50
No. 2 forge fire scrap, ordinary	10.00 to 10.50
Wrought turnings	14.00 to 14.50
Axle turnings, heavy	15.00 to 15.50
Cast borings	13.00 to 13.50
Stove plates	13.50 to 14.00
Heavy melting steel	17.50 to 18.00

ST. LOUIS.

Numerous Inquiries But Few Sales of Pig Iron—Scrap Advances.

Jan. 11.

Pig Iron.—Quite a number of inquiries for pig iron in lots of from 75 to 150 tons, for immediate shipments were received in the St. Louis territory last week, and one feeler is out this morning for 500 tons for shipment over the second quarter of next year. No business of consequence was placed. Prices are ruling steady at $13 to $13.50, Birmingham, for No. 2, and dealers believe a good buying movement will begin soon. Our quotations, delivered, to which the freight of $3.75 from Birmingham has been added, follows:

No. 1 southern	$17.25 to 17.75
No. 2 southern	16.75 to 17.25
No. 3 southern	16.25 to 16.75
No. 4 southern	15.75 to 16.25

Coke.—Connellsville coke is quoted from $2.25 to $2.75, ovens, the latter price for the best-selected 72-hour foundry grades, one firm having sold three carloads at $2.75 last week, one car for immediate shipment, one for shipment in February and another in March. Connellsville 48-hour furnace coke is quoted at from $1.80 to $2.10, f. o. b. ovens, the higher price for the best-selected grades. Virginia and West Virginia grades are firm at from $1.80 to $2, ovens. The freight East St. Louis and St. Louis is $2.80 and $2.70 on Virginia coke when shipments are destined beyond St. Louis.

Old Material.—There has been a stiffening of prices for scrap iron within the last several days, with an indication of a better market. Dealers believe the climax of dullness has been reached, and look forward to considerable improvement. Our quotations are as follows:

Cast iron borings, free from foreign material, net tons	$ 6.00
Steel axle turnings, gross tons	12.50
Steel railroad axles, net ton	17.50 to 18.50
Iron railroad axles, net ton	19.00 to 20.00
Miscellaneous steel scrap, gross ton	12.50 to 13.50
Old car wheels, gross ton	16.00
No. 1 railroad cast scrap, net ton	12.00 to 12.50
Heavy machinery cast, net ton	13.00 to 14.00
Stove plate and light cast, net ton	11.50
Sheet iron, net tons, uncut	5.00
No. 1 railroad wrought, net ton	13.00 to 13.50
Railroad malleable, net ton	12.00 to 12.50
Heavy melting steel, net ton	13.00 to 13.50
Relaying rails, net ton	17.00 to 18.00

BUFFALO.

The Pig Iron Market Quiet, With No Change in Prices.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Jan. 12.

Pig Iron.—The market is not very active this week and most of the inquiries and sales are running small. This is explained by the fact that many consumers are busy taking inventory at this time. There is not likely to be much change in the pig iron market situation here before the end of the month. It looks as though quotations would stand unchanged for some time, according to present indications. We quote, f. o b. Buffalo, as follows:

No. 1 X foundry	$16.75 to $17.25
No. 2 X foundry	16.25 to 16.75
No. 2, plain	15.75 to 16.25
No. 3	15.50 to 15.75
Malleable Bessemer	17.00 to 17.50
Gray forge	15.25 to 15.50
Charcoal	20.50 to 21.00

BIRMINGHAM, ALA.

Fair Demand for Pig Iron—Tennessee Company Improvements.

Jan. 11.

Southern iron manufacturers are selling their product right along. "We sold 20,000 tons for future delivery," said one iron man. "We are selling some small lots of low grade iron," said another, while still another said, "The market is giving signs of awakening and good trade is looked for in the near future." There appears to be no idea of rushing the market on the part of the manufacturers in this section. That there will be need for a large quantity of iron is evidenced by the inquiry that is being received here. Cast iron pipe makers who melt a large quantity of iron in the course of time have been asking southern iron companies as to the product and their ability to deliver. Some of the furnace companies have been sounding the market again at the $13.50 per ton, No. 2 foundry, quotation, but the $13 rate is holding firm. Some small lot orders are being received, immediate delivery stipulated. The make in this district has not recently been improved any, though preparations to that end are still being made. There is positively no accumulation of iron and the production of December, placed at 146,803 tons, will be repeated, if not improved, during this month.

Much activity is noted now at the steel plant of the Tennessee Coal, Iron & Railroad Co. Another of the open-hearth furnaces has been lighted up and the production at the big plant is to be improved from time to time.

The Tennessee Coal, Iron & Railroad Co. is reported to have purchased a large tract of land between Ensley and Bessemer, in the Birmingham district, and will use the same for a new iron blast furnace plant, structural iron and steel works, and other industries. A water works system will be erected at once, securing a supply of water from the Warrior river, 25 miles distant, for the many industries in the steel city. The system will be in within four or five months, it is expected, by which time many of the developments under consideration will have been started on.

BRITISH IRON MARKET.

Fair Amount of Buying in Spite of the Holidays.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Jan. 2.

The week following Christmas is usually quiet, so that the maintenance of prices both in Cleveland and in the Midland markets may be taken as a hopeful feature. In spite of the holidays there has been a fair amount of buying, the usual figure for the Cleveland warrants being 49s 2d ($12.04), a figure fractionally better than that of a week ago. For forward buying 6d more is usually obtained, a difference which indicates a fairly optimistic feeling as to the future. Stocks continue to increase with a disconcerting persistence, the present tonnage being 133,671 as compared with

89,600 a year ago. The exports have been remarkably poor, and probably account in themselves for the growth of stocks. The total sent away in December was 69,988 tons, compared with 97,858 tons in November, and 112,812 tons a year ago. In the Birmingham district, buying still goes on, but most consumers have now satisfied their requirements and will wait the course of events before buying extensively forward. On the other hand, smelters are very well off for orders, and one or two large firms contemplate blowing in additional furnaces. Business is rather slow in hematite, largely on account of the general stoppages of steel works for the holidays. East Coast makers ask 56s ($13.70) per ton for mixed numbers. Welsh hematite is a shade weaker. In the Barrow district, the hematite trade is rather depressed and some furnaces, it is thought, will go out of blast, owing to the poor demand for rails.

GERMAN IRON MARKET.

Bottom Prices Reached—Effort to Form a Bar Iron Syndicate.

Dusseldorf, Dec. 29, 1908.—As the buyers are convinced that the prices for different iron and steel products have touched the bottom, they are now more inclined to cover their requirements for longer periods ahead, the more because renewed efforts have been made for forming a new syndicate for the sale of bar iron. It is remarkable that, notwithstanding the bad general situation, the total production in bar iron is growing constantly and that it is far greater than in 1908, although at the expense of lower prices. Besides, the motion for buying has been encouraged by the situation on the market for wire products, where the joint policy of the American and European works has caused a better tone. This has had a certain influence on other products and it is also assisted by somewhat firmer pig iron prices. In the latter product, very considerable contracts have been made in all qualities as far as July, 1909, and the producers have now enough to do for the next few weeks. However, it must be feared, that a great percentage of these pig iron contracts has been made on speculation and that the legitimate demand will not be able to take all that has been bought. Fresh efforts for the renewal of the late Luxemburg pig iron syndicate have no positive and definite result yet, but the efforts are being continued. Some merchants of great influence are still obstinate. The market for old material is rather firm and rising, although buyers keep back. Great quantities are being exported.

In half finished products the situation remains rather unchanged; buyers have contracted their requirements for the next two or three months, the prices remain unchanged. In railway material, our works have received a greater order from China and a few other orders for export are still pending. The orders from the state railways remain very small and on the export market, Russia is a very strong and keen competitor.

After all, it seems that we have now definitely touched the bottom and that things cannot go worse.

CHICAGO.

Radiator Interest Buys Pig Iron—Sharp Competition Among Fabricators.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Jan. 12.

The western markets have not yet broken away from the extended period during which larger transactions have been absent and small orders and routine business have ruled. Except for one or two spots where some little brightness made its appearance, the week just past was of the same character. The leading radiator company through its Chicago office closed for 12,000 tons of foundry iron for eastern delivery, the iron being purchased from a Buffalo furnace. A local foundry bought 2,000 tons of southern iron. The mill situation during the week was featured by the starting of the new mill of the Riverdale Iron & Steel Co. at Riverdale, Ill., and by the first try-out of the Gary mill on rails. The bar mills are running about as last reported. The western fabricating shops are sufficiently lacking in work to induce as sharp competition for contracts as has prevailed at any time in the past year. Railroad buying is quiet. Two new rail inquiries for a total of about 30,000 tons are reported. Structural mills are fairly busy rolling steel which is now being delivered on the several large contracts recently placed here. The structural contracts placed during the last week were few and of minor importance. An advance of $1 a ton in cast iron pipe prices is announced. Scrap prices are off and the market in this material is weak.

Pig Iron.—Through its Chicago offices the leading radiator interest contracted for 12,000 tons of foundry iron for delivery in the second quarter at an eastern plant. The iron will be made at a Buffalo furnace. A local jobbing foundry whose inquiry was mentioned last week purchased 2,000 tons of southern iron for second quarter and the price is understood to have been $13 Birmingham. In addition, about 3,000 tons of southern iron was disposed of, in which was one lot of 1,000 tons for delivery at the rate of 200 tons a month beginning in February. The price was $13. Some high silicon iron was sold also. Local furnaces had a quiet week. Prices are without change and we quote for the first half as follows:

Lake Superior charcoal	$19.50
Northern foundry No. 1	18.00 to 18.50
Northern foundry No. 2	17.50 to 18.00
Northern foundry No. 3	17.00 to 17.50
Southern foundry No. 1	17.85 to 18.35
Southern foundry No. 2	17.35 to 17.85
Southern foundry No. 3	16.85 to 17.35
Southern foundry No. 4	16.35 to 16.85
Southern No. 1 soft	17.85 to 18.35
Southern No. 2 soft	17.35 to 17.85
Southern gray forge	15.60 to 16.10
Southern mottled	15.35 to 15.60
Southern silveries, 4 per cent silicon	18.10 to 18.60
Southern silveries, 5 per cent silicon	18.35 to 18.85
Southern silveries, 6 per cent silicon	18.85 to 19.35
Jackson Co. silveries, 6 per cent.	19.90
Jackson Co. silveries, 8 per cent.	20.40 to 20.90
Jackson Co. silveries, 10 per cent.	21.90
Malleable Bessemer	17.00 to 17.50
Standard Bessemer	17.65 to 18.15
Alabama Basic	17.35 to 17.85

Billets.—The demand for billets is light, but prices appear to be quite firm. A few orders for lots of 100 tons and less are reported, as well as some tonnage of axle billets. We quote 4 x 4-inch rolling billets, $26.50, and forging billets, $28.50, base Chicago.

Merchant Steel.—Wagon manufacturers' iron has been in better demand during the week since the first of the year and vehicle manufacturers generally have come into the market for iron and steel in better quantity. Bar iron is slightly improved but still quiet. Implement manufacturers have not ceased to order steel bars almost on full schedule specifications. There has been practically no change in mill activity since last month. Inquiry is a little better perhaps for mill goods, but the new year business has not yet opened up very strongly. We quote as follows for Chicago delivery:

Bar iron, 1.50c to 1.53c; soft steel bars and bands, 1.58c, half extras; soft steel angles, less than 3 x 3, 1.68c; hoops, 1.98c base, full extras; planished or smooth-finished tire steel, 1.78c; iron finish, up to 1½ x ½-inch 1.73c base tire card; iron finish, 1½ x ½-inch and larger, 1.58c base steel card; channel for solid rubber tire,

¾ to 1 inch, 2.08c; and 1⅛ inch and larger, 1.98c; smooth-finished machinery steel, 1.83c; flat sleigh shoe, 1.63c; concave and convex sleigh shoe, 1.83c; cutter shoe, 2.95c; toe calk steel, 2.13c; railway spring, 1.93c base steel card; vehicle spring steel, 1.98c base vehicle card; crucible tool steel, 7c to 9c, with higher prices asked on special grades. Quotations on shafting are 56 per cent off the list for carload lots, and 52 per cent off for less than carload lots, carload freight allowed to points in base territory. On iron and steel bars from local stocks, we quote as follows: Bar iron, 1.90c to 2c, full extras; soft steel bars, 1.80c per 100 pounds base, plus half extras; soft steel hoops, 2.30c, full extras.

Plates.—Plate tonnage continues light and price concessions are still to be encountered. Local jobbers have contracted for small tonnages, but the aggregate tonnage is small. We quote nominal prices as follows:

Plates, ¼-inch and heavier, 6¼ to 100 inches wide, either universal or sheared, 1.78c Chicago. For extras see Pittsburg report. Shippers' prices for shipment from local stocks are as follows: Tank steel, ¼-inch and heavier, up to 72 inches wide, 2c to 2.10c; from 72 inches to 96 inches wide, 2.10c to 2.20c; 3-16-inch up to and including 60 inches wide, 2.10c to 2.15c; 72 inches wide, 2.355c to 2.45c; No. 8, up to 60 inches wide, 2.10c to 3.15c. Flange and head quality, 25c extra.

Sheets.—Sheet trade has been quiet until within the last few days, when an improved inquiry and buying were noticeable, particularly in the lighter gages and galvanized. Prices appear to be quite firm despite the dullness and we quote as follows for Chicago delivery from store:

No. 10, 2.15c to 2.25c; No. 12, 2.20c to 2.30c; No. 14, 2.25c to 2.35c; No. 16, 2.35c to 2.45c; Nos. 18-20, 2.60c to 2.65c; Nos. 22-24, 2.65c to 2.70c; No. 26, 2.70c to 2.75c; No. 27, 2.75c to 2.80c; No. 28, 2.85c to 2.95c; No. 30, 3.25c. galvanized sheets, Nos. 10 to 16, 3.05c to 3.10c; Nos. 18 to 20, 3.15c to 3.25c; Nos. 22 to 24, 3.30c to 3.35c; No. 26, 3.50c to 3.55c; No. 27, 3.70c to 3.75c; No. 28, 3.90c to 4c; No. 30, 4.40c to 4.50c.

Structural Steel.—The contract for the Crane-Best plant at Pittsburg has been let, one building, in which was about one-half of the total tonnage, going to the American Bridge Co., and the remainder of the 3,000 tons going to the Riter-Conley Mfg. Co. The Wisconsin Bridge Co. took the 500-ton contract for the St. Paul road and the Burrill Bridge Co., of San Francisco, was awarded the contract for a 700-ton bridge at Missoula, Mont. This company is not a fabricator and will buy the steel. The Roberts-Johnson-Rand Co., of St. Louis, has contracted with Jas. Stewart & Co., for a new building in which there will be 1,300 tons of steel, the contract for which is to be let at once. In addition, the American Bridge Co. took about 1,000 tons in small miscellaneous orders and a fair tonnage of other small orders went to other fabricators. Specifications are being received in good volume from the Santa Fe and Harriman lines. The structural mills are fairly busy turning out shapes and a large tonnage of steel is about to be delivered. Deliveries have been begun in this city on 4,400 tons for the Blackstone hotel and on the 24,000 tons for the Northwestern track elevation. Next week steel will be delivered for the Northwestern terminal building. The contracts for the Hurt-Shaffner-Marx building, 3,844 tons, were signed today, bids having been received on the Vendome building, John Griffiths & Son, Chicago, being the low bidder, the gas company building and the city hall will follow at once in erection, so that with respect to actual work in progress the structural situation locally is fairly satisfactory. The immediate future has nothing large in prospect, however, with considerable fabricating capacity still unfilled. Prices do not indicate very substantial conditions. We quote as follows:

Beams and channels, 3 to 15 inches, inclusive, 1.78c to 1.81c, delivered Chicago. For extras see Pittsburg report. Quotations from store are as follows for carload lots and over:

All angles, 3 inches and larger, including 6 inches, $1.95 per 100 pounds; angles over 6 inches, $2.05 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.95 per 100 pounds, base; channels, 3 inches and larger, $1.95 per 100 pounds, base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—An inquiry for about 22,000 tons of standard section rails is in the market from the International & Great Northern railroad and an inquiry also for 8,000 tons for the Great Northern road. No further purchases of rails have been made in the west as yet. Sales of track fastenings include 5,000 kegs of spikes, 8,000 kegs of bolts and 2,600 tons of angle bars. The rail mill at Gary, Ind., began rolling on its first rails on Monday on power furnished from South Chicago. This was merely a try-out and the ingots were furnished from South Chicago. We quote mill prices as follows:

Standard Bessemer rails, $28; open-hearth, $30, f. o. b. mill in 500-ton lots and over; less than 500 tons, $2 extra, full freight to destination; light rails, 25-pound to 45-pound, $26; 20-pound, $27; 16-pound, $28; 12-pound, $29. Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; spikes, 1.80c to 1.90c; track bolts, with square nuts, 2.15c to 2.25c; with hexagon nuts, 2.30c to 2.40c. Small railroad and square boat spikes, 1.90c base, f. o. b. Chicago.

Merchant Pipe and Boiler Tubes.—A moderate buying on the part of local jobbers increased the pipe tonnage sold last week above the average of the past few weeks. There seems to be, however, no movement toward the replenishment of stocks to any thing like normal size and such purchases as were made had the appearance of an adjustment of stocks following inventory. We quote mill discounts as follows:

	—Steel—	
	Black.	Galv.
¾ to 6 inches, inclusive.....	73.2	63.2
7 to 12 inches, inclusive.....	70.2	55.2

BOILER TUBES.

	Steel.	Iron.	Seamless.
2¾ to 5 inches, inclusive..	63.2	50.2	50.2

Cast Iron Pipe.—The contract lettings at Duluth and Minneapolis resulted in the placing of 1,500 tons for Duluth with the United States Cast Iron Pipe & Foundry Co., and the deferring of the Minneapolis award. Pipe prices, which have been quite firm for some time past, have been advanced $1 on almost all sizes. We quote revised prices as follows: 4-inch water pipe, $28; 6 to 14-inch, $27; larger sizes, $26; gas pipe, $1 a ton higher.

Wire Products.—Notwithstanding the fact that the various territories were not canvassed during the holiday season, the wire products trade has maintained itself surprisingly well and a fully normal volume of business has been received. The prospect for the spring trade which should begin within a month. We quote for Chicago delivery as follows:

Wire nails, jobbers' carload lots, $2.13; retailers' carload lots, $2.18; painted barb wire, jobbers' carload lots, $2.28; retailers' carload lots, $2.33, with 30c for galvanizing; plain wire to jobbers in carloads, 1.98c, and to retailers in carloads, $2.03. Wire rods, Bessemer, $33; open-hearth, $34;

chain rods, $33, f. o. b. Pittsburg.

Old Material.—The noteworthy feature of the scrap situation is the continued weakness in prices, and the fact that the prices being paid to the railroads are no longer materially higher than the regular market for consumptive buying. The Rock Island scrap tonnage reported a week ago as 1,000 tons was increased to 3,800 tons and was taken almost entirely by one dealer. A list for about 8,000 tons was issued by the Baltimore & Ohio. The larger part of the tonnage offered a week ago has not yet been disposed of, so that there is little in immediate conditions to add strength to the situation. We have revised our prices and quote as follows:

Old car wheels	$15.25 to 15.75
Old iron rails	18.75 to 19.25
Re-rolling rails (4 ft. and over)	15.75 to 16.25
Old steel rails (4 ft. and under)	14.50 to 15.00
Light section relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	19.00 to 19.50
Frogs, switches and guards	13.25 to 13.75
Heavy melting steel	14.00 to 14.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$13.75 to 14.25
No. 2 R. R. wrought	12.75 to 13.25
Knuckles, couplers and springs	13.00 to 13.50
Shafting	16.00 to 16.50
Iron car axles	20.00 to 20.50
Steel car axles	18.00 to 18.50
Dealers' forge No. 1	11.00 to 11.50
Pipes and flues	10.75 to 11.25
No. 1 cast, 150 lbs. and less	13.00 to 13.50
No. 1 mill	9.00 to 9.50
Mixed busheling (Nos. 1 and 2)	9.25
Country sheet	5.50 to 6.00
No. 1 boiler cut	10.00 to 10.50
Boiler punchings	12.50 to 13.00
Cast borings	7.00 to 7.50
Mixed borings, etc.	7.00 to 7.50
Machine shop turnings	8.75 to 9.25
Railroad malleable	12.50 to 13.00
Agricultural malleable	11.00 to 11.50
Stove plate and light cast scrap	12.00 to 12.50
Old iron splice bars	16.00 to 16.50

NEW YORK.

Strong Undercurrent in Pig Iron, But Sales are Not Numerous.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., Jan. 12.

Iron Ore.—Some further activity in iron ore is reported, including the recent sale of 10,000 tons offered by a Cuban producer. Considerable chartering of vessels for handling the Spanish and Russian orders recently booked is being done, but so far as can be learned no further selling of these ores has taken place.

Pig Iron.—On the surface the eastern market is relatively quiet, sales being restricted to rather small tonnages for early delivery. It develops, however, that there is a very strong undercurrent, due to the fact that a heavy inquiry is being privately circulated and some important business of a non-competitive nature is being closed. Some of the strongest buyers are asking prices on deliveries well into the future, in extreme instances into 1910, but furnace interests are not inclined to consider business ahead of the first half and are asking a good premium for future shipment. The largest transaction reported during the week is the purchase by a Philadelphia pipe maker of about 20,000 tons of southern iron. Pipe irons are extremely scarce both in the north and south, partly because of the high prices of scrap, but particularly because weather conditions during the past three months have so favored furnace operations that relatively little low grade iron has been produced. The meeting of the Eastern Pig Iron Association next week will throw some light upon whether or not stocks are increasing. The largest accumulation in the east is in the Virginia district, where one interest is now holding more than 100,000 tons upon its yards in anticipation of an advance. No important basic sales are noted and transactions in other lines have been rather small, though prices are firm for first quarter delivery, New York tidewater, as follows:

Northern foundry No. 1	$17.75 to 18.25
No. 2X foundry	17.25 to 17.75
No. 2 plain	16.75 to 17.25
No. 2 southern foundry	17.25 to 17.75
Malleable	18.00 to 18.50
Basic	17.00 to 17.25
Gray forge	16.25 to 16.75

Ferro-Alloys.—There has been considerable selling of 50 per cent ferro-silicon, one house reporting sales of about 200 tons in the last two weeks. Otherwise the alloy market is quiet and prices are unchanged, ferro-silicon bringing $44 for prompt, and $45 to $46 for future shipment

Finished Materials.—The structural market in the east is extremely quiet both in regard to the closing of contracts and the development of new projects. The Gracehull apartments of this city, 500 tons, will be furnished by the Passaic Steel Co. The receivers of Milliken Bros. have secured the Harris county court house at Houston, Texas, 400 tons, and are reported to have taken about 1,900 tons for the Interborough Co. at the Williamsburg bridge approach. The Congress street bridge at Bridgeport, Conn., 850 tons, went to Snare and Triest. Two school houses at Philadelphia, calling for close to 800 tons, were taken by the McClintic-Marshall Construction Co. The Syracuse Bridge Co. secured a small building for the New Process Raw Hide Co. and a 350-ton trestle at Columbus, O., went to an independent interest. The Triumph Electric Co., Cincinnati, placed a contract for its building, 850 tons, with the Interstate Engineering Co. Several small contracts in the San Francisco district have recently been placed, aggregating perhaps 2,000 tons. No important new projects have developed in the eastern district. The Suffolk county court house, requiring 1,000 tons of steel, has been bid on again, F. T. Nesbitt & Co., of this city, being low at $666,666. The Jenkins estate at Pittsburg is in the market for a 400-ton building and the Prager Dry Goods Co., San Francisco, is shortly to close on 1,300 tons.

Billets are in brisk demand, particularly in New England, where specifications are being given freely and some anticipations are being asked. In cast iron pipe three small New England towns will next week have lettings totaling about 1,000 tons. R. D. Wood & Co. secured the Providence letting, 1,400 tons of 4 to 16-inch, at $23.20 delivered. Other finished lines manifest little change and we quote:

Angles, 2 to 6 inches x ¼-inch and heavier, 1.76c; beams, 3 to 15 inches, 1.76c; tees, 3 x ¼-inch and heavier, 1.81c; plates, carloads, tanks, 1.76c; marine boilers, 2.16c; bar iron, 1.56c to 1.61c; soft steel bars, 1.56c; sheets, No. 28, black, 2.66c.

Old Materials.—The market locally is quiet and prices are unchanged. Rumors are current of heavy sales of melting steel in the eastern Pennsylvania territory, but these cannot be substantiated and generally are given prompt denial. Wrought pipe is in good demand, while cast borings are somewhat weaker. We quote, gross tons New York delivery as follows:

Old steel rails (re-rolling)	$15.50 to 16.00
Relaying rails	21.50 to 22.00
Old car wheels	14.00 to 14.50
Old iron car axles	20.00 to 21.00
Old steel car axles	19.50 to 20.50
Heavy melting steel	15.00 to 15.50
No. 1 railroad wrought	17.00 to 17.50
Iron track scrap	14.50 to 15.00
Wrought pipe	12.50 to 13.00
Cast borings	10.00 to 10.50
Wrought turnings	11.00 to 11.50
Heavy cast scrap	14.00 to 14.50
Railroad malleable	13.00 to 13.50
Stove plate	10.00 to 10.50
Grate bars	11.00 to 11.50

METAL MARKET

CHICAGO.

Jan. 12.

A very good buying of copper characterized the past week. Several large lots for future delivery were purchased, as well as a scattering of smaller quantities. The market is distinctly firmer as a result. Lead and zinc are somewhat weaker. We have changed our prices and quote as follows:

Lake copper, carload lots, 14⅞c to 15c; casting, carload lots, 14¾c; pig tin, 30¾c to 31c; spelter, 5.25c to 5.35c; pig lead, desilverized, 4.35c to 4.40c in 50-ton lots; corroding, 4.80c to 4.90c in 50-ton lots; car lots, 2½c per 100 pounds higher; sheet zinc, 7c list, f. o.

b. LaSalle in car lots of 600-pound flask; Cookson's antimony, 10½c to 11c; other grades, 10c.

Prices of old metals to dealers are not greatly changed and the movement is slow. We quote prices to buyers as follows:

Copper wire, 12¾c; heavy copper, 12¾c; light copper, 11½c; heavy red brass, 11½c; heavy yellow brass, 8¾c; light brass, 6¾c; No. 1 red brass borings, 9½c; No. 1 yellow brass borings, 8c; brass clippings, 8¾c; tea lead, 3¼c; lead scrap, 3¾c; zinc, 3.25c; tin pipe, 24c; tin foil, 22c; pewter, 16c; electrotype plates, free from wood, 3¾c; electrotype dross, 2½c; stereotype plates, 4¼c; stereotype dross, 2½c; prime slab zinc dross, $62 per ton.

NEW YORK.

Jan. 12.

Copper.—The market has been up ⅛ cent and down again during the week, with light selling. We quote: Lake, 14⅜c to 14⅝c; electrolytic, 14⅛c to 14¼c; casting, 14c to 14⅛c.

Pig Tin.—The situation is weaker both at home and abroad, with current selling small at from 27⅞c to 28c.

Pig Lead.—The market is easy with prices unchanged at 4.17½c to 4.22½c.

Spelter.—We quote 5.12½c to 5.17½c, offerings being rather scanty.

Antimony.—Cookson's, 8.15c to 8.25c; Hallett's, 8c to 8.10c; ordinary brands, 7.75c to 7.87½c.

ST. LOUIS.

Jan. 11.

Lead and Zinc.—The cold snap of last week curtailed the output of lead and zinc in the Missouri-Kansas-Oklahoma district. Many small operators were forced to suspend operations and some of the larger ones closed because the gas supply was diverted to the cities.

Zinc sold as high as $42 base, and one bin was reported to have brought $43. The top price paid was $45, and much of the ore was disposed of at $40 to $41. Lead brought from $52 to $54 a ton. The bins are well supplied with sulphur zinc and quite a quantity of sulphur lead, and probably will not be cleaned out until higher prices rule. Silicate of zinc sold for $19, with a high price reported of $24.

Hickman, Williams & Co. have secured office quarters for their New York office in the Hudson Terminal building, No. 30 Church street, New York, which they will occupy on Feb. 1.

LATE NEW YORK NEWS.

(Special Telegram.)

New York, Jan. 13.—Milliken Bros. secured the Prager dry goods building, San Francisco, 1,300 tons.

The Carnegie Steel Co. reports good trade in steel car wheels, one week's bookings recently being 1,900 wheels.

The Republic Iron & Steel Co.'s operations equal December, which was the best of last year.

PERSONALS.

Carl Steinbacher, superintendent of the Belfont furnace, was painfully but not fatally injured several days ago at Ashland, Ky. A brick fell from the top of the Ashland furnace, striking Mr. Steinbacher on the head.

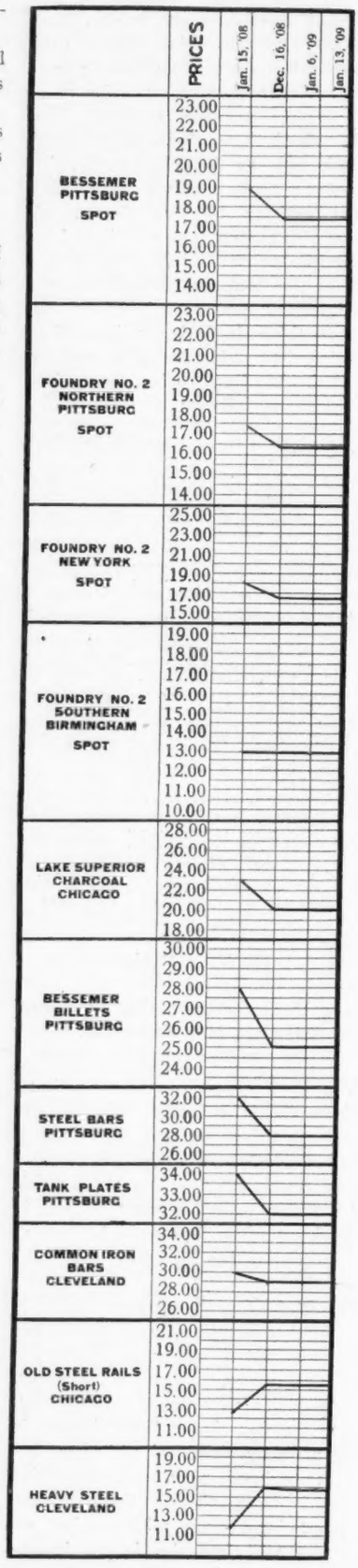
Samuel B. Sheldon, general superintendent of the Lackawanna Steel Co.'s plant at West Seneca, N. Y., has resigned to accept a position with the Bethlehem Steel Co. Mr. Sheldon went to the Lackawanna company from Joliet, where he was superintendent of the Illinois Steel Co.'s plant. He will be succeeded as general superintendent by George F. Downs, formerly his assistant. Mr. Downs went to Buffalo from the Illinois Steel Co.

Will Increase Operations.—The Standard Steel Car Co., Pittsburg, is preparing to materially increase the operations of its steel car works at Butler, Pa. Contracts have been placed for a considerable amount of manufacturing material and a number of men will shortly be added to the works force. The plant will be run on the orders which the company has accumulated during the past several months.

More Coke Ovens.—The Jamison Coal & Coke Co., Pittsburg, has begun the construction of 60 additional coke ovens at its No. 1 plant located at Luxor, Pa. The ovens will be of the standard bee-hive type and when completed will increase the capacity of the plant to 410 ovens. They are expected to be fired in about 60 days.

Bar Mill Wages Unchanged.—Examination by the committees representing the Amalgamated Association of Iron, Steel and Tin Workers, and the Republic Iron & Steel Co., Pittsburg, Jan. 11, showed that there will be no change in the wages of puddlers and bar mill finishers in January and February. Puddlers continue to receive $5.25 a ton, based on a 1.30 card.

PRICE CHART.



PIG IRON SPECIFICATIONS

Considered by Philadelphia Foundrymen's Association.

The January meeting of the Philadelphia Foundrymen's Association received the report of the special committee appointed a month previous to draw up standard specifications for pig iron. This committee is composed of Walter Wood, R. D. Wood & Co., chairman; A. E. Outerbridge Jr., Wm. Sellers & Co., Inc.; Dr. Richard Moldenke, secretary American Foundrymen's Association; George C. Davis, chemist; and H. L. Haldeman, Pulaski Iron Co. The association ordered the report printed and distributed and continued the committee for the handling of further matters arising in this connection. The full report follows:

Your committee would respectfully report that, following the instructions of your association, they have, in drawing the enclosed specifications, abandoned the buying of pig iron by number. The tables are so arranged that different qualities of pig iron can be accurately designated by their chemical content. There are three points which, perhaps, it is desirable to speak of.

First—As buying by analysis fails as to a standard for newspaper quotations, it is proposed that there shall be a grade established upon which prices can be based, known as "No. 2," which shall be of a quality of metal similar to the foreign standard grading upon which warrants are issued, this grade to analyze as stated in the specifications.

Second—So that buyers and sellers can readily express the character of the metal they want, symbols have been put after each analysis, the combination of which into one word will express exactly what the buyer desires, thus saving considerable expense in telegraphing. Further, these symbols condensed into a word will be of value when warehousing iron, as the word written into the certificate will accurately describe the iron that is stored.

Third—If a purchaser wishes to split the steps at which silicons vary (0.50 per cent), the tables are so arranged that he can designate silicons with a difference only of 0.25 per cent.

Your committee believes that, with these explanations, the reason for the new departures will be entirely clear and that the tables are so arranged that it will be possible for any one in the foundry business to designate with precision the metal he desires.

Proposed Standard Specifications for Foundry Pig Iron.

Analysis—It is recommended that all purchases be made by analysis.

Sampling—Each carload or its equivalent shall be considered as a unit. At least one pig shall be selected from each four tons of every carload, and so chosen from different parts of the car as to represent as nearly as possible the average quality of the iron.

Drillings shall be taken so as to fairly represent the fracture surface of each pig. The sample analyzed shall consist of an equal quantity of drillings from each pig, well mixed and ground before analysis.

Percentage of Elements—Opposite each percentage of the different elements a syllable has been affixed so that buyers, by combining these syllables, can form a code word to be used in telegraphing such inquiries as they may desire to make.

CARBON.

Total carbon not less than 3.25 per cent.

SILICON.

Per cent.	Symbol.
0.50	Ca
1.00	Ce
1.50	Ci
2.00	Co
2.50	Cu
3.00	Cy
3.50	Ch

0.25 allowed variation.

SULPHUR.

Per cent.	Symbol.
0.03	Sa
0.04	Se
0.05	Si
0.06	So
0.07	Su
0.08	Sy

Maxima gravimetric method.

PHOSPHORUS.

Per cent.	Symbol.
Less than 0.20	Pa
0.30	Pe
0.60	Pi
0.90	Po
1.20	Pu
1.50	Py

0.15 allowed variation.

MANGANESE.

Per cent.	Symbol.
0.40	Ma
0.60	Me
0.80	Mi
1.00	Mo
1.20	Mu
1.60	My

0.20 allowed variation.

Example—Code word Ci-se-pi-ma represents Silicon, 1.50; sulphur, 0.04; phosphorus, 0.60; manganese, 0.40. Whenever standards one-half between the standards above are desired, they will be designated by the symbol X. Thus: "Cix" means 1.75 per cent silicon or in trade parlance 1.50 to 2.00 per cent silicon; and "Cox" means 2.25 per cent silicon, or in trade parlance 2.00 to 2.50 per cent silicon. For market quotations a grade shall be assumed to be known as No. 2 analyzing: Silicon, 2.50 per cent and over, and sulphur 0.04 per cent or under.

The association held its annual election and continued for another year the entire list of officials, as follows:

President, Thomas Devlin, Thomas Devlin Mfg. Co.; vice president, Alex. E. Outerbridge Jr., Wm. Sellers & Co., Inc.; treasurer, Josiah Thompson, J. Thompson & Co.; secretary, Howard Evans, J. W. Paxson Co.; executive committee, E. E. Brown, E. E. Brown & Co.; Thomas M. Eynon, Eynon-Evans Mfg. Co.; H. L. Haldeman, Pulaski Iron Co.; George C. Davis, chemist, 39 South Tenth street; James S. Stirling, Hilles & Jones Co., Wilmington, Del.; trustees, Thomas Devlin president, Josiah Thompson treasurer, Howard Evans secretary; official chemist, George C. Davis.

OBITUARY.

Charles R. Jones, one of the leading and best known business men in Syracuse, N. Y., and secretary and treasurer of the Frazer & Jones Co., died Jan. 8 in that city. He had been stricken with paralysis the day before. Mr. Jones was born in Syracuse 47 years ago. As a youth he began his business career as a bookkeeper in the employ of the Frazer & Jones Co. After securing a general knowledge of the hardware and saddlery business he was several years later made an officer of the company. He is survived by a widow.

J. H. Day, president of the J. H. Day Co., of Cincinnati, manufacturer of baking machinery, died Jan. 11, aged 58. He had been ill about eight weeks suffering from hardening of the arteries which brought on paralysis. He was educated at the University of Illinois and after being engaged for a time in business at Minneapolis and at Nokomis, Ill., went to Cincinnati and became secretary of the Hunters Sifter Co. Later he went to New York and engaged in the machinery brokerage business. In 1887, he returned to Cincinnati, brought out the machinery department of the Hunters Sifter Co. and organized the firm of J. H. Day & Co. In 1897 he built the present large plant of the company on Harrison avenue in Cincinnati. The company employes about 400 men and has its own foundry. In 1901 he organized the J. H. Day Co., with his nephew, M. E. Lyons, and F. M. Dudley.

Alexander Thomas, secretary of the Crucible Steel Co. of America, died Jan. 8 at Hamburg, Germany, aged 59 years. Mr. Thomas had been engaged in some branch of the iron and steel industry during his entire business life. He had traveled extensively in foreign countries in the interests of his company, and was well known as a steel expert. He was on one of these periodical foreign trips when the fatal illness overtook him. Mr. Thomas was born in Steubenville, O., in 1850, and after receiving a practical education went to Pittsburg and became employed by Park Bros., then conducting the Black Diamond Steel Co. At later times he was manager of the Aliquippa Steel Co., conducted an iron and steel brokerage business in Pittsburg, and was also associated with the Bolt & Steel Co. of Canton and the Globe Nail Co. of Boston. When the plant of Park Bros. was merged with the Crucible Steel Co., Mr. Thomas became secretary.

THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades

PUBLISHED EVERY THURSDAY BY
THE PENTON PUBLISHING CO.
CLEVELAND.

BOSTON.....73-74 Journal Bldg.
BUFFALO.....932 Ellicott Sq.
CHICAGO.....1328 Monadnock Blk.
CINCINNATI.....First National Bank Bldg.
NEW YORK.....1005 West Street Bldg.
PHILADELPHIA.....408 Central Trust Bldg.
PITTSBURG.....510 Park Bldg.
SEATTLE.....302 Pioneer Bldg.

Subscription, United States and Mexico, $3.00 per annum. To Canada and Foreign Countries, $4.50. Advertising Rates Furnished on Application.

Change of advertising copy must reach this office ten days preceding date of publication.

The Cleveland News Co. will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.

European Agents: The International News Company, Breams Building, Chancery Lane, London, E. C., England.

ENTERED AT THE POST OFFICE AT CLEVELAND AS SECOND CLASS MATTER.

PRINTED IN AN OPEN SHOP.

COPYRIGHT 1909 BY PENTON PUBLISHING CO.

January 14, 1909.

THE FACTS ABOUT AN ABSORPTION.

Senator Culberson, of Texas, evidently thought he would uncover a mare's nest when he introduced his resolution calling for information concerning the absorption by the United States Steel Corporation of the Tennessee Coal, Iron & Railroad Co., but the only result is to disclose facts which are entirely praiseworthy concerning the attitude of the president and the representatives of the corporation. It is peculiar, however, how misleading statements can be made about the real facts in the case. Even the usually accurate and conservative *Springfield Republican* declares that "the president's offense consisted in assuming that there might be a law prohibiting the absorption and then absolving the steel corporation for violation of the same." The president did nothing of the kind. Let us see what the actual facts were.

After the panic of October, 1907, was started, there was grave danger that a number of important financial institutions in New York and perhaps elsewhere would be involved, owing to the fact that stock of the Tennessee company was being carried in loans by banks and trust companies. It was reported that the aggregate advances were fully $10,000,000, and *The Financial Chronicle* stated that, if the truth were known, the aggregate might be found to amount to $20,000,000. In ordinary times, it would not have been difficult for the banks and trust companies to carry this burden, but at the time in question cash was almost unobtainable, general conditions were feverish, and there was danger of far more disastrous consequences than had yet occurred. The stock of the Tennessee company did not meet the demand of such a critical period, as it could not readily be converted into cash, while, on the other hand, bonds of the Steel Corporation could be easily negotiated or turned into cash. The substitution of practically non-negotiable stock for the bonds of the Corporation brought great relief to a tense situation.

Before, however, the transaction was consummated, Judge Gary and Mr. Frick, representing the steel corporation, and showing a characteristic disposition not to take any chance of violating the law, went to the president and explained to him the object of the contemplated absorption. They stated that, as a mere business transaction, they did not care to purchase the Tennessee stock, and that under ordinary circumstances they would not do so, that the Corporation had followed the policy of declining to acquire more than 60 per cent of the steel properties of the country and that the acquisition of the Tennessee company would not raise the percentage owned by the Steel Corporation above 60. They expressed their desire to do all they could to prevent a panic and, as the president expressed it, a "general industrial smashup," and that they did not wish to carry out the transaction if the president stated that it ought not to be done. "I answered," says the president, in his recent message to congress, "that, while, of course, I could not advise them to take the action proposed, I felt it no public duty of mine to interpose any objection." The president adds that after the absorption was consummated, he was orally advised by the attorney general that in his opinion no sufficient ground existed for legal proceedings against the Steel Corporation, and that the situation had been in no way changed by the acquisition of the Tennessee company. It will thus be seen that the president did not assume that there might be a law preventing the absorption, but that he simply felt it was not his duty to interpose an objection. He rendered an important public service in taking this position, and it is well for the sake of all concerned that the facts have become known.

THE PROSPECTS OF IRON AND STEEL CONSUMPTION.

The second week in the new year finds the iron and steel trade with increasing business, well distributed over the country, and of the same solid character that characterized the tonnage of 1908. No spectacular tonnages are going, but there is an excellent distribution, and the business has the earmarks of permanence. The best barometer of general buying in the steel trade is perhaps the wire branch, and the latest reports from it are of the most satisfactory character, the week having opened up with an excellent volume of buying, which is well distributed.

There remains the disposition to look to the railroads as the only source from which the drag on the market can be removed. It is being stated in trade circles that if only the railroads would buy, the iron and steel trade would not be far from attaining its old time activity, but it is pointed out that it may be some time yet before the railroads can borrow money and resume their former activity.

Undoubtedly these statements are true, but there is a tendency to magnify the importance of railroad buying, or at least of that branch of it which relates to financing of a broad char-

acter, or, in common parlance, the borrowing of large sums of money. Railroad improvements of such a character do not necessarily involve the largest tonnages of iron and steel. It may be that the railroads are not in position to make great extensions and improvements, but they stand to consume a great deal of steel nevertheless. There are certain expenditures which may be deferred for months, or perhaps for a year, but they cannot be deferred indefinitely.

Analyzed as to tonnages, the situation is probably more promising than is generally supposed. While the year of heaviest pig iron production was 1907, the year of heaviest rail output was 1906, with 3,977,887 tons, 1907 showing a decline of 10 per cent from that record, so that already the railroads are two years away from their maximum. Rails are required for replacement, and such buying cannot be deferred indefinitely.

As to steel cars and structural material, which are more in the line of long-range improvements, there is not much comparison with rails in point of tonnage. In 1906, when about 4,000,000 tons of rails were produced, the total production of plates, 12 gage and heavier, was only 2,531,552 tons, while of structural shapes the output was 2,118,772 tons, so that these two products furnished between them only 4.650,000 tons, between 11 and 12 per cent more than the tonnage of rails. The portion of the plate and shape production taken by the railroads, in the form of fabricated material and cars, was quite subsidiary to the rail tonnage. Then, again, the buying of steel cars is in a measure in the line of an ordinary improvement. Against a large portion of the steel cars built in the past few years old wooden cars have been scrapped, and to an extent the replacing of wooden cars by steel cars is an ordinary every-year improvement.

These tonnages, in any event, are merely tonnages and do not represent value in comparison with the lighter lines such as sheets, tin plates, wire products, bars and pipe, all of which lines have done strikingly well in the past year as compared with the so-called heavy lines. If the output of 1908 was reckoned in dollars instead of tons, the comparison with 1906 and 1907 would be much more favorable than is the tonnage comparison.

RELATIVE VALUES OF SCRAP AND FINISHED MATERIALS.

Editor IRON TRADE REVIEW:

The question of market value of scrap material is of peculiar interest at this time. Prices are influenced to a large extent by supply and demand, but there are other important considerations that scrap dealers are prone to overlook.

From a consumer's point of view, "relative value" is the primary factor, and the basis of value is the price the manufacturer is able to obtain for finished or semi-finished material. For the various grades entering into the production of bar iron, the market price of bars would be the base, and for the several grades consumed by steel melters the averag price of billets would be the basis.

The writer, in comparing market prices of scrap material for a period of years covering a wide range of quotations, was impressed by the regularity of differential values, indicating that the relative values of the several grades would be uniform under normal conditions, and whenever the values were not uniform in relation to various grades, the market was abnormal, either too high or too low. Furthermore, it was found that the tendency was invariably toward proper adjustment. The important question to be determined was the condition that would be considered a normal market, and the conclusions as detailed below give our best judgment in this regard.

For strictly No. 1 wrought scrap, the market value should be 50 per cent of the average selling price of bar iron. Iron rails should be 12½ to 15 per cent higher than wrought scrap, and iron axles 25 to 30 per cent higher than wrought scrap. Assuming the average price of bar iron today to be $30 net ton, this would figure $15 per net ton for No. 1 wrought scrap, $18.90 to $19.32 gross ton for iron rails, and $21 to $21.85 gross ton for iron axles.

No. 1 heavy melting steel scrap is worth 66 2-3 per cent of the average selling price of billets, bundled sheet scrap should be 85 per cent of the value of heavy melting scrap, No. 1 turnings 75 per cent and clean cast borings 66 2-3 per cent of the value of heavy melting scrap. Assuming the present market on billets to be $25 gross ton, this would figure as follows: $16.67 for heavy steel scrap, $14.17 for bundled sheet, $12.50 for steel turnings and $11.10 for cast borings.

If these estimates of comparative value are correct, it would indicate that No. 1 wrought scrap is at present entirely too high, as are other grades of iron scrap. Heavy melting steel is about right, but bundled sheet scrap at prices being asked and offered is out of proportion and must find its proper level. It is reasonable to assume that there will be no immediate advances in the market for iron bars or steel billets. Consequently the adjustment must be in scrap. A. F. BAUMGARTEN.

Pittsburg, Jan. 9, 1909.

PRICES OF SILVERY IRONS.

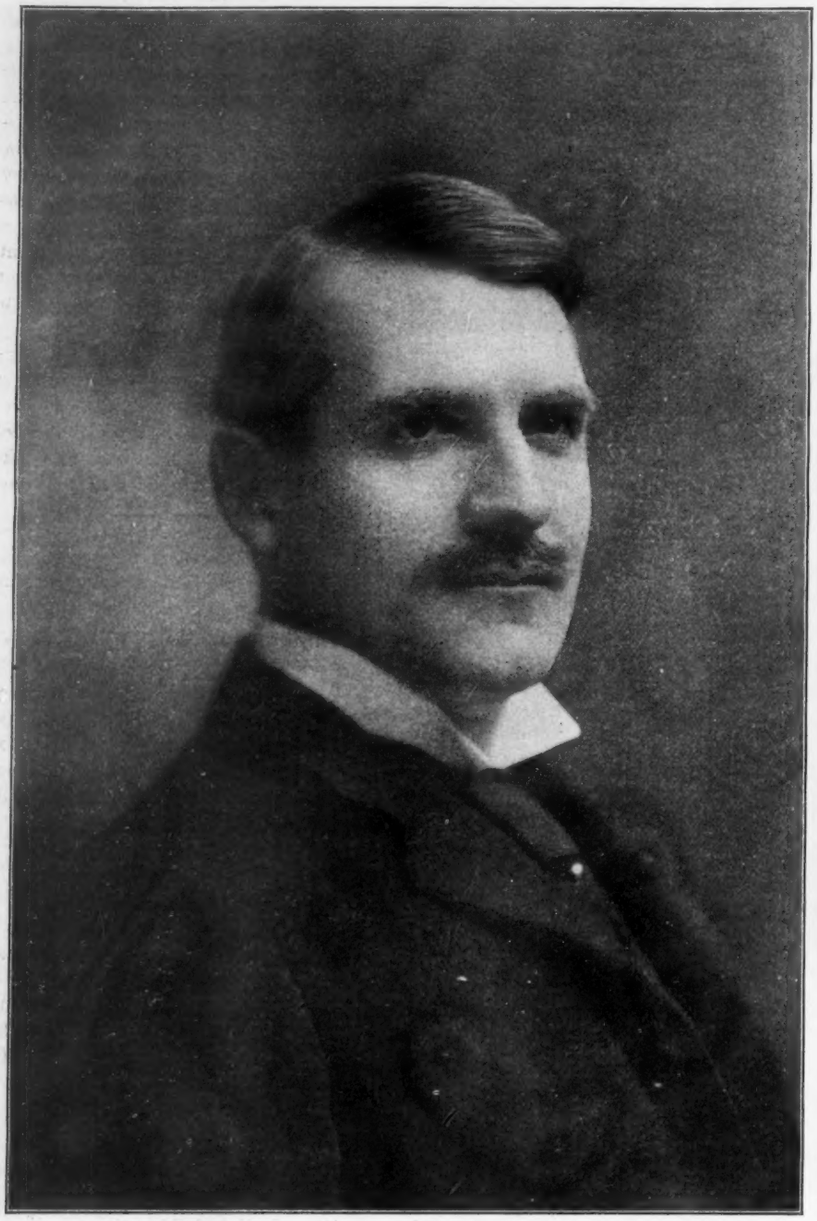
Taking effect at once, a change is to be made in the plan of marketing Jackson county silvery irons. The furnaces in the Jackson county district are serving notice that on these high silicon irons the price will change with every one-half of 1 per cent of the silicon content. Up to and including 10 per cent silicon the difference will be 25 cents per ton and above 10 per cent, 50 cents per ton for each one-half of 1 per cent silicon content. To illustrate this more clearly and give the range of silicon content to be understood in contracts the following table is presented. The prices here inserted are today's market based on $18.50 at furnace for 8 per cent silicon. It will be noted that the range in silicon content will average the same as the percentage sold.

Per cent.	Silicon will range per cent.			Price.
4	3.75	to	4.25	$16.50
4½	4.25	to	4.75	16.75
5	4.75	to	5.25	17.00
5½	5.25	to	5.75	17.25
6	5.75	to	6.25	17.50
6½	6.25	to	6.75	17.75
7	6.75	to	7.25	18.00
7½	7.25	to	7.75	18.25
8	7.75	to	8.25	18.50
8½	8.25	to	8.75	18.75
9	8.75	to	9.25	19.00
9½	9.25	to	9.75	19.25
10	9.75	to	10.25	19.50
10½	10.25	to	10.75	20.00
11	10.75	to	11.25	20.50
11½	11.25	to	11.75	21.00
12	11.75	to	12.35	21.50

The Embree Iron Co.'s Tennessee furnace was lighted Dec. 13, and for the remainder of the month made the best production in the history of the stack in a similar period.

FIRST VICE PRESIDENT DICKSON AND ASSISTANT.

William B. Dickson, recently elected first vice president of the United States Steel Corporation, to fill the vacancy caused by the resignation of James Gayley, has been connected with the



WILLIAM B. DICKSON.
First Vice President, United States Steel Corporation.

Carnegie and Corporation interests through his entire business career. He is still a comparatively young man, having been born in Pittsburg in 1865.

Mr. Dickson made his start at the Homestead works in 1881 and for several years thereafter was employed in the converting, blooming and rail mills. He then graduated into the mill office and in 1889 was transferred to the city offices of the company, where he occupied several minor positions, principally in connection with the "order" department. This department had to deal with the relations between mill and customer after the order had been received. Following this, Mr. Dickson was placed in charge of the purchasing of pig iron, scrap and other materials, and was given the title of assistant to the president.

In 1899 Mr. Dickson was admitted to partnership in the Carnegie Steel Co. and was made a managing director, a position which he held at the time the Corporation was organized. He then went to New York as assistant to President Schwab and shortly thereafter was elected second vice president, in which position he continued until his recent elevation to the first vice presidency.

Mr. Dickson's work with the Corporation has been chiefly in connection with inter-company relations, with the distribution of semi-finished material and with the purchase of pig iron and scrap. He is president of the Minnesota Steel Co. and is connected with other Corporation subsidiaries.

Ward B. Perley.

Like Mr. Dickson, his able assistant, Ward B. Perley, started to work at an early age, his first employment beginning in 1881 with King, Gilbert & Warner at the Franklin furnace, Co-

WARD B. PERLEY.
Assistant to First Vice President.

lumbus, O. When that firm was absorbed by the National Steel Co., Mr. Perley continued in the employ of that concern, which later became a part of the United States Steel Corporation. Franklin furnace is now No. 2 stack at the Columbus Steel Works of the Corporation (Carnegie Steel Co.). Mr. Perley was assistant to Mr. Dickson when the latter was assistant to the president of the Corporation. He continued in the same capacity with Mr. Dickson when he became second vice president, and was advanced with Mr. Dickson's election as first vice president. Mr. Perley has been chairman of the Corporation's pig iron committee since its organization.

ANNUAL CHART

Showing Price Fluctuations During the Past Fifteen Years.

The chart which accompanies this issue as a supplement shows fluctuations in the prices of iron and steel products for the past 14 years. The figures on which the chart is based are the average weekly prices given in the market reports of THE IRON TRADE REVIEW. They are computed for the following: Tank plates, Chicago; beams, Pittsburg; bar iron, Cleveland; Bessemer billets, Pittsburg; Bessemer pig iron, Pittsburg; No. 2 foundry, Chicago; gray forge, Cincinnati; No. 2 foundry, Birmingham. This year a new line has been added, showing prices of steel bars from 1897 to 1908, both inclusive, in response to a general demand for this additional information. The prices in accordance with the line for steel bars are given in the accompanying table.

The vertical lines in the chart represent months, and the horizontal lines the prices in dollars per net ton in the case of finished material, and per gross ton in the case of pig iron and steel billets. The solid and broken lines traversing the diagram indicate the changes in the monthly average prices, but do not, of course, show the extreme high or extreme low prices which may have been reached in some week of the month. In the case of pig iron, the minimum quotations for prompt delivery are taken.

The chart shows the short-lived boom of 1895, which followed a period of depression; then the decline in the latter part of 1895, followed by the slow general decline of 1896 and 1897, when in midsummer the lowest prices on record prevailed; a rather steady trend of prices from the middle of 1897 until the fall of 1898; the rapid rise at the close of 1898 followed by the very high quotations of the boom year, 1899; a sharp decline in 1900, and a partial recovery at the close of the year; a continuance of prices upward during 1901; a rapid advance during the first half of 1902; a sharp decline beginning the fall of 1902 and continuing during 1903, followed by a long period of prosperity, ending in October, 1907, although there were some price recessions earlier in 1907. The increasing tendency noted in past years in these columns to keep away from extremely high or extremely low quotations has been emphasized during the past year of depression, especially in the case of finished materials.

A few extra copies of the chart have been published and will be sent in tubes to subscribers who request them for framing. The charts are the same size as those of last year and will fit into the old frames.

PLANS LARGE LOCOMOTIVE PLANT AT GARY.

The American Locomotive Co. has purchased 130 acres of land at Gary, Ind., adjoining the property of the United States Steel Corporation. It is having plans drawn for a new plant which, the officers of the locomotive company say, will be most complete and the best equipped works in the country. In an official statement it is said that the land purchased is twice as large in area as that occupied by the largest of the company's present plants, and when fully operated will give employment to from 12,000 to 15,000 workmen. This will be the first large locomotive plant to be erected west of Pittsburg. The size of the works will be sufficient to provide liberally for the growing needs of railroads in the central west for years to come.

Stock to Employes.—The United States Steel Corporation for the first time has offered to its employes common stock on a basis of $50 a share. It also offers preferred stock at $110 a share. Heretofore the company has offered preferred stock, which has been liberally subscribed for. Last year subscriptions from employes amounted to more than 60,000 shares, but the corporation allotted only 25,000 shares.

The Struthers Furnace Co. lighted its Struthers, O., stack Jan. 11, after relining the stack and installing a gas washer.

CARNEGIE OFFICIALS BANQUET.

The annual banquet of the officials of the Carnegie Steel Co. was held at the Duquesne club, Pittsburg, Saturday evening, Jan. 9. From the standpoint of elegance, the affair was upon a more elaborate scale than any of its predecessors, the nature and elaborateness of the decorations being particularly striking. President Wm. E. Corey, of the United States Steel Corporation, was the guest of honor of the evening. Andrew Carnegie, Elbert H. Gary and James Gayley were unable to accept their invitations.

Colonel H. B. Bope, vice president of the Carnegie Steel Co., acted in the capacity of toastmaster. The toast list included the following responses: "Specialties," by John C. Neale, of the plate and structural department; "Modern Metallurgy of Steel," by W. Arthur Bostwick, and "Iron and Steel Factory Problems," by Chas. E. Dinkey, superintendent of the Edgar Thomson works.

Rebecca Blown In.—The rebuilt Rebecca furnace of the Kittanning Iron & Steel Mfg. Co., at Kittanning, Pa., was blown in Jan. 4. Miss Margaret Neale, of Buffalo, granddaughter of the late C. T. Neale, of Pittsburg, formerly president of the company, applied the torch in the presence of several hundred spectators. Foundry, forge and basic pig iron will be produced. The new stack is 80 feet high with a bosh diameter of 18 feet, and a hearth diameter of 11 feet, and was built to replace an old stack erected in 1870, which, though originally designed for a daily capacity of 60 tons, was making approximately 200 tons when it was finally blown out in December, 1907. The output of the new stack will be 300 tons daily.

The greater part of the construction work at the A. M. Byers' mill at Girard, O., is completed, and the machinery is being installed. It is believed that the plant will be operating within a short time.

Prices of Steel Bars, Pittsburg, 1897-1908.

	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.
January	$21.00	$19.00	$21.00	$45.00	$25.00	$30.00	$32.00	$26.00	$28.00	$30.00	$32.00	$32.00
February	21.00	19.00	23.00	45.00	26.40	30.00	32.00	26.00	28.00	30.00	32.00	32.00
March	21.00	19.00	23.00	45.00	28.80	32.00	32.00	26.40	30.00	30.00	32.00	32.00
April	20.00	19.00	30.00	43.00	29.00	32.00	32.00	27.00	30.00	30.00	32.00	32.00
May	20.00	18.00	36.00	40.00	29.00	32.00	32.00	27.00	30.00	30.00	32.00	32.00
June	19.00	18.00	45.00	29.40	29.00	32.00	32.00	27.00	30.00	30.00	32.00	28.00
July	18.40	18.00	45.00	23.00	29.00	32.00	32.00	27.00	30.00	30.00	32.00	28.00
August	18.00	19.40	49.40	22.00	29.00	32.00	32.00	27.00	30.00	30.00	32.00	28.00
September	19.00	20.00	50.00	22.00	29.40	32.00	32.00	26.40	30.00	30.00	32.00	28.00
October	20.00	20.00	50.00	22.00	30.00	32.00	32.00	26.00	30.00	30.00	32.00	28.00
November	20.00	19.00	47.40	24.00	30.00	32.00	29.00	26.00	30.00	31.00	32.00	28.00
December	19.50	20.00	45.00	25.00	30.00	32.00	26.00	26.40	30.00	32.00	32.00	28.00

DEATH OF JOSEPH WHARTON.

Joseph Wharton, president of the Wharton Steel Co. and of the American Iron and Steel Association, died Jan. 11, at "Ontalauna," his residence on the old York road in Philadelphia. He was almost 83 years of age, but had been in rugged health and had engaged actively in the management of his varied interests until July, 1907. At that time he made an extensive foreign trip, being entertained by the Kaiser, and was stricken with illness of a paralytic nature while in London. He recovered sufficiently to return home, but never regained his health, which was further impaired by a fall, and some three weeks ago his condition became critical. His bodily infirmities, although keeping him to his home, did not prevent him from administering his business affairs until quite recently. Up until 18 months ago he was very fond of outdoor exercise, particularly horseback riding, swimming, rowing and skating.

Realizing that his strength was passing, Mr. Wharton, more than a year ago, organized the Wharton Steel Co., with a capital of $10,000,000, and to this turned over his pig iron, iron ore, coke, limestone and railroad interests. His sons-in-law, J. Bertram Lippincott and Harrison S. Morris, are officials in this company.

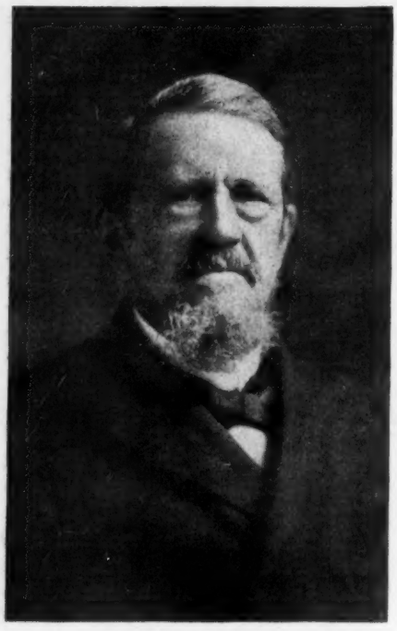
One of Mr. Wharton's last acts was to present to the city of Philadelphia about 25 acres of original forest land which the city had been attempting to purchase for park purposes for several years. The land is worth $100,000.

Mr. Wharton's Career.

Mr. Wharton was in his 83d year, having been born in Philadelphia, March 3, 1826. As a youth he was not strong and his parents' plan to have him educated at Harvard was abandoned, and at the age of 16 he was sent to work on a farm. After three years of this rough work, his health was fully established, and at the age of 19 he was apprenticed with a Philadelphia dry goods house. Within a year he was head bookkeeper. In THE IRON TRADE REVIEW of April 4, 1907, in the Eminent Men of the Iron World Series, an extended biographical sketch of Mr. Wharton has published. In that article it was said:

It is a common practice nowadays to speak of one who has spent a lifetime in a certain line of activity as a "pioneer" in that industry, though in reality he may have merely followed in the footsteps of those who blazed the trail and cleared the way—the true pioneers. To the latter class Joseph Wharton belongs. His claim to the distinction is not based on his attainments in a single field of effort, for to him must be ascribed the establishing of at least two great industries in America besides his doings in iron and steel, gold, silver, copper, lead and tin.

It was under his direction and in furnaces constructed in accordance with the results of his experiments that metallic zinc, or spelter, was first produced on a commercial basis in the United States. After demonstrating that it could be so manufactured, he turned his attention to nickel, and here his success in the production of zinc was duplicated and surpassed, for he won the signal honor of being the first in the world to produce pure nickel in malleable condition. He played a principal part in establishing here the manufacture of armor plates and large steel gun forgings, etc.; namely, at the works of the Bethlehem Steel Co., which, under the superintendence of John Fritz, was already famous for the excellence of its products. Aside from these, he has won distinction in several other industries. It is worthy of note that he is now the largest individual producer of pig iron in America; that he has brought the concentrating of iron ores to a high state of efficiency and that he is the dominating factor in the steam-vessel fisheries of the Atlantic coast. He has given freely of his time and means in aid of better education, being always a stanch supporter of the practical in college training. And finally, busy as he is with a multitude of business cares, he finds time now and then for a clever bit of literary work, the enjoyment of which is reserved for a little circle of his friends.



JOSEPH WHARTON.

When the government of the United States undertook the building of a new navy, William C. Whitney, then secretary of the navy, appealed to Mr. Wharton to build a plant to make the required armor plate. This was accomplished after many delays and the expenditure of a vast amount of money by the Bethlehem Steel Co., of which Mr. Wharton was the largest stockholder and controlling spirit.

With four modern blast furnaces having a daily output of 1,000 tons, Mr. Wharton had the distinction of being America's largest individual producer of iron, until his properties were taken over by the Wharton Steel Co., organized about a year ago. He began making iron about a third of a century ago in his small, poorly equipped furnace at Hackettstown, N. J. He afterwards bought a small furnace at Port Oram, N. J. (the name of the postoffice later being changed to Wharton), which he rebuilt, and in 1900-01 he erected a great modern furnace plant, and two years later another stack was added to the group at Wharton, N. J. He also acquired the Andover furnace at Phillipsburg, N. J. He was the owner of ore mines, which, for the most part, supplied the requirements of his furnaces. He was the owner of extensive coal mines and had numerous other business connections.

Mr. Wharton was a Republican from the time of the organization of that party and was always a stanch advocate of the policy of protection. He received honorary degrees from University of Pennsylvania and Swarthmore College. He was president of the American Iron and Steel Association, a member of the Iron and Steel Institute, and one of the oldest members of the American Philosophical Society.

Starting Time Complications.—The quarter century old controversy over the daily starting hour for manufacturing concerns at Youngstown, O., has now developed a three-fold side. Beginning Jan. 11, the Youngstown Sheet & Tube Co. and the Republic Iron & Steel Co. adopted eastern standard time at their plants, whistles sounding at 7:00 A. M. and 12:00 M. eastern time. The Carnegie Steel Co.'s plants at the same time adopted central standard time, starting whistles blowing at 6:00 and 11:00 A. M. central time. To further complicate the complex time situation at Youngstown, a number of the smaller shops and foundries use sun time, which in this case is 28 minutes faster than central standard time and 32 minutes slower than eastern time.

AMONG MACHINERY MAKERS.

NEW YORK.

Little, if Any, Improvement in Orders —American Locomotive Plant.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., Jan. 12.

Dealers generally report a fair trade in the lighter classes of machinery during the opening week of the new year, and here and there can be found concerns which are enjoying a relatively brisk business. In these cases, however, some particular reasons for the activity can usually be discovered, and it is probably true that the average business current is no heavier than the average of November and December, while in certain lines it is decidedly slower. There is no buying of importance by the railroads or by equipment manufacturers, and not much trade is looked for in this direction until the more pressing needs of the transportation companies in the way of track repairs and replacements have been cared for more generously. The supply of cars is ample, even with the extremely large number on the disabled list, and repair shops are not yet working full. Practically the only active demand for heavy machine tools is coming from the motor car builders. There is some call for equipment from smaller metal-working shops, but not enough to develop extensive business. Export trade seems to have picked up, a particularly good demand being noted for industrial cars to go abroad.

Specifications are now being prepared under the direction of the department of docks and ferries of New York City for the light, heat and power equipment of the large block of piers recently completed on the North river. This will entail the installation of three power houses, each to serve three piers, and the amount involved will probably run close to $500,000. Eventually a similar amount will be expended in providing suitable hoisting and conveying apparatus. These specifications are being prepared by the department, with the assistance of an engineer representing the interests of the three steamship companies leasing the piers, and will be ready for figures in the early future. The department has also begun preliminary work in connection with the development of water front recently purchased in South Brooklyn, but it will be some months before this assumes definite shape.

Official verification is given the report that the American Locomotive Co., 30 Church street, New York City, has acquired a tract of about 130 acres at Gary, Ind., where an extremely large plant will eventually be erected. It is stated, however, that nothing definite in this connection can be expected in the early future.

The Goodell-Pratt Co., Greenfield, Mass., is adding a foundry building, 75 x 120 feet, to its tool manufacturing plant at Greenfield, Mass., reinforced concrete construction being employed.

The Benson Mines Co., principal offices of which are at Philadelphia, has been taking figures during the past week on a steel building to house a nodulizing plant at Benson Mines, New York. This method of treating iron ore concentrates is being employed by the Northern Iron Co. in this district with marked success.

The new foundry plant to be erected by the T. H. Symington Co. will be located at Rochester, N. Y., instead of Corning, as originally planned. Construction work will probably not be begun until spring, as a considerable bond issue is to be disposed of. Plans and detailed drawings are now being made by George K. Hooper, consulting engineer, at 11 Broadway, New York.

A foundry building, 50 x 100 feet, is to be erected by the Turner & Seymour Co., Torrington, Conn.

The Cutler-Hammer Mfg. Co., 50 Church street, New York City, has acquired a site on 144th street, in this city, on which it will erect a five-story manufacturing building.

The structural steel and boiler shop of the Elba Iron Mfg. Co., located at Beverly, N. J., only a short distance from Philadelphia, is to be sold at auction, Jan. 28, by James A. Freeman's Sons, 1229 Chestnut street, Philadelphia. The plant has an annual capacity of about 2,000 tons. Real estate, machinery and other equipment will be disposed of.

BUFFALO.

Considerable Business in Machinery Lines Developing.

Office of THE IRON TRADE REVIEW, 932 Ellicott Sqare, Jan. 11.

Conditions of the machinery market in the Buffalo district are improving in a very satisfactory way. The beginning of 1909 brought a new and healthy tone to the trade and a lot of substantial business is in sight. Probably the biggest prospect at the present time and one which is receiving a good deal of attention from the manufacturers is the Washburn-Crosby Milling Co.'s project to build a large addition to its flour milling plant at Buffalo. The plans for this enterprise are rapidly nearing completion and involve the purchase of nearly $200,000 worth of machinery and equipment. The milling machinery represents a large part of the cost, although the power equipment is a large item. Plans for power facilities have not been perfected. Steam turbines and motors are being considered.

In Buffalo, Rochester and also in Syracuse, there are a number of big orders in sight. If industrial plans do not miscarry, the machinery trade should become more and more active. Inquiries are reported generally on the increase. It was stated in one quarter today that the present condition of trade compared favorably with the same period of 1907 and a marked improvement over the opening of 1908.

CLEVELAND.

Drop Forgings in Demand—A Few Machines Sold.

Office of THE IRON TRADE REVIEW, Browning Building, Jan. 12.

The close of December found the machinery market of Cleveland and its vicinity in a healthy condition. It has been a noticeable fact that for the last few months, while the majority of the manufacturers have been suffering for want of business, the makers of forgings and parts for automobiles have been adding to their forces in order to fill the increasing number of orders. But the sale of machinery has nevertheless been slowly progressing and growing also, until the beginning of the new year finds this branch of the manufacturing industry on a firm footing and ready for rapid advancement. Foundries have been increasing their output and contracting for many new orders for castings, all of which forecasts a better future for machinery. Although business as a whole is still in a stupor, we are nevertheless justified, from the facts that inquiries are

so much more numerous and that business has increased so materially during the last month of the year, which is usually so much duller than the other months, in looking for a new year which has already commenced under favorable circumstances and promises to progress slowly but surely towards a renewal of the much-needed activity and prosperity.

The Browning Engineering Co. has recently installed in the plant of the Erie Forge Co., of Erie, Pa., an electro-magnet for the handling of material. The company is about to put on the market a new controller which is claimed to be of unusual efficiency because of the fact that, when the current of the magnet is shut off, it is broken slowly, keeping the potential down to such an extent that there is no danger of insulation.

The business of the Wyman & Gordon Drop Forging Co. during the past month has reached such a stage that it has been found necessary to work 11 hours a day. Within the last few days, two contracts of about $20,000 each and one of $5,000, have been booked. Things are looking even better for the future, and it is uncertain whether the present equipment will be sufficient to take care of all the work.

The Champion Machine & Forging Co. reports that business is gradually increasing. During the past few days, seven nail machines have been ordered to be shipped to Chicago, while the prospects of filling a contract for eight more are exceedingly good.

The Cleveland branch of Hill, Clarke & Co., which recently doubled its show room capacity, has been receiving a goodly number of inquiries, and the fact that only recently three milling machines were contracted for in one day seems to indicate that the firm will soon be doing a better business.

Business is rapidly regaining its normal condition for the Cleveland Crane & Engineering Co., of Wickliffe. Among some of the recent contracts which have been filled are the following: A coal-handling outfit to be installed in the plant of the Philadelphia Co. of Pittsburg; a 20-ton, three-motor, 60-foot span for the Erie Forge Co., of Erie, Pa.; a 15-ton, 47-foot crane for the Pittsburg & Conneaut Dock Co. Work on 10 three-motor, 49-foot span cranes for the Panama canal is yet unfinished. Next week three 75-foot, five-motor electric cranes will be shipped to the Scully Steel & Iron Co., of Chicago.

CINCINNATI.

Moderate Inquiry—Some Shops Changing Foundries.

Office of THE IRON TRADE REVIEW,
First National Bank Bldg., Jan. 12.

Business in machine tools and machinery is holding up in this market fairly well. The outlook for the future is, however, much more encouraging than the actual business now coming in. Most of the shops are receiving a few orders right along, but the inquiry shows an increasing tendency and several lists of machine tools wanted, one by a western railroad, are under consideration. Business has apparently not entirely recovered from the holidays and from the taking of inventories and other features incident to the beginning of a new year. Some of the shops are changing foundries and this is making a little irregularity among the foundrymen, as some are taking on new contracts and contracts are expiring with others; these changes in the placing of machine tool castings by the shops makes some foundries busier than others; but on the whole there appears to be a slight improvement in the orders for castings. Some of the smaller shops are busy and running full time and full force, while some of the larger shops making the heavier types of machines are still on short time; or with reduced working forces. Several good sized contracts for new engines and boilers are under consideration, but there is a lack of call for heavy engines.

The Acme Tool Co., a new concern, incorporated about the first of the year, has become organized, C. H. M. Atkins having been elected president and J. H. Williams, secretary. The new company will begin operations about March 1 in the Spring Grove avenue building, which the Cincinnati Planer Co. is vacating. The Acme company is in the market for the following tools: A 22 x 5-foot planer, a 30 x 12-foot double-head planer, a 16-inch back gear crank shaper, a 14 x 6-inch lathe, a 16 x 6-inch lathe, a 16 x 8-inch lathe, a 20 x 10-inch lathe and a 22 x 12-inch lathe. Also a 12 x 60-inch universal grinder, a No. 3 internal grinder, cutter and reamer grinder; a wet-tool grinder, a 5-inch cold saw, a No. 1½ universal milling machine, a 3½-foot radial drill, one sensitive drill, a horizontal boring and drilling machine, 3-inch bar; a special machine for boring spindles, a 30-inch gear cutter, and a gas furnace.

The Cincinnati Planer Co., which is preparing to put its Oakley plant in operation, is in the market and will purchase at once the following additional equipment: One No. 3 plain milling machine, one 48-inch boring mill, one large grinding machine, one key seating machine, and one belt lacing machine.

The first annual banquet given by E. W. Edwards, president of the Edwards Mfg. Co., to the traveling and foreign representatives of the company, was given last week at the Business Men's Club. Those present were E. W. Edwards, H. W. Edwards, G. R. Edwards, W. A. Edwards, O. S. Larkby, J. F. Agnew, T. Reed Chunn, A. J. Pearce, L. R. Hildreth, O. F. Kline, James Kinsella, Sr., C. Spornhauer, P. M. Pope, James Tracey, N. D. Jones, F. Wilfert, H. Woodward, J. M. Reynolds and A. H. Lovejoy.

The Cincinnati Milling Machine Co. reports business holding up satisfactorily and the plant is now running on full time and with a normal force of men. This comment is somewhat significant under the present conditions, as the company operates one of the largest shops in this machine tool center.

On Friday evening, Jan. 8, the annual meeting and dinner of the foremen, superintendents and officials of the Cincinnati Milling Machine Co. was held at the Business Men's club. It is the custom of this concern to have monthly meetings of superintendents and foremen, and at the first meeting after the new year it is customary to have a dinner with the officials present, the object being an interchange of ideas and the discussion of plans for the promotion of the general interest of the concern.

M. L. Andrew, of M. L. Andrew & Co., manufacturers of special machinery, announces that he has purchased property at the southwest corner of Colerain avenue and Alabama street and that plans are now in the hands of architects for the construction of a new shop. It is contemplated to construct a building 40 x 160 ft. and the work will be pushed to completion as rapidly as possible. The firm, in addition to continuing the manufacture of special machinery, will add a line of heavy multiple iron drills and multiple wood boilers, particullarly designed for use in car building and general railroad work. The firm will be in the market for considerable additional machinery as soon as the new shop is ready for occupancy.

J. H. Day, president of the J. H. Day Co., manufacturer of bakers' machinery, is seriously ill at the Good Samaritan hospital. He has been ill about seven weeks. His condition at this writing is critical.

Schumacher & Boye have issued a calendar this year which is somewhat unique, combining as it does the features

of a calendar and catalog. There are 12 sheets, one for each month in the year, and on each sheet is displayed a handsome cut of one of the Schumaker & Boye lathes.

MILWAUKEE.

General Belief in Prosperity Prevailing During Present Year.

Milwaukee, Wis., Jan. 11.—For years the iron and steel manufacturing trade has led all other industries of Milwaukee and until the past year there has been a decided increase each 12 months. Manufacturers say that, remembering the fact that up to November, 1907, the greatest output in the history of the business was experienced, the record of the year just passed ought to be very satisfactory. The machinery output of Milwaukee for the past year is represented at $30,000,000 as compared with the showing of $40,000,000 made in 1907.

Thomas J. Neacy, president and general manager of the Filer & Stowell Mfg. Co., sums up the situation when he says:

"The heavy machinery business of the year fell off nearly one-third because of general conditions and the uncertainty in the world at large concerning our tariff revision. Personally, I would say that the company with which I am identified is only indirectly interested in tariff revision, but this is not the case with all machinery manufacturing concerns. I believe that the year 1909 will be a good year for machinery manufacturers, as there is a splendid outlook. The year 1908 was good as to results, considering the great depression under which we labored."

Theodore Vilter, of the Vilter Mfg. Co., says that the trade in ice making machinery began to be revived just after the Chicago and Denver conventions and that improvement has been gradually taking place since the election.

Despite the fact that the past year experienced a slight falling off in the machinery business of Milwaukee and surrounding suburbs, most of the big concerns took the opportunity of making the most of a period somewhat quiet by installing improvements and by the erection of additions and new plants. This condition of affairs is evidenced by the experience of some of the leading plants at West Allis, a Milwaukee suburb. Three concerns, the Pressed Steel Tank Co., the Milwaukee Stamping Co., and the West Allis Malleable Iron, Chain Belt Co., built large additions last year, aggregating at least $36,000. The plant of the Pressed Steel Tank Co. will practically be doubled by the substantial addition erected. The Fred Prescott Pump Co. has also made extensive improvements at a cost of $15,000, mostly in new machinery. The total output of all of the manufacturing plants of West Allis for the past year, including that of the Allis-Chalmers Co., aggregates a total of $10,000,000 as compared with the record of $11,000,000 made the previous year. Present indications are that this record will be greatly increased for the year 1909, as officials of the Allis-Chalmers Co. believe that at least $15,000,000 worth of business will be transacted by that concern alone.

Officers of the Geuder & Paeschke Mfg. Co., of Milwaukee, recently entertained their sales representatives at a dinner.

The Northwestern Boiler Works Co., at Superior, has completed two large boilers for the Water, Light & Power Co., at Superior, which are now being installed. Several other substantial improvements are being made by the power company.

The common council at Superior, Wis., has accepted the plans prepared for the erection of a $12,000 steel foot bridge over the railroad tracks at that city and bids will soon be called for.

PITTSBURG.

Less Hesitancy in Ordering—Spang-Chalfant Improvements.

Office of THE IRON TRADE REVIEW,
510 Park Bldg., Jan. 12.

The improved tone in machinery lines is manifesting itself in a moderately freer contracting. Orders are now being placed with somewhat less hesitancy on the part of buyers although most of the contracts now being closed, particularly in rolling mill and steel works equipment, have been under extended negotiation. Considerable new work is appearing in prospective form and estimating activity is holding at a steady gait. Arrangements are shaping themselves satisfactorily with respect to several new steel and rolling mill projects and contracts are expected to be placed soon.

While December was probably the best month of the year for orders taken in machine tools, the orders booked are relatively small and the market is still in an unsatisfactory condition, from the standpoint of makers and sellers. The single tool demand has undergone some improvement. The railroads are placing little business in machine tools. It is felt that the doubt over the tariff agitation is adding a further excuse to prospective buyers for the withholding of orders.

The roll foundries are doing a little better in their operations, but the active capacity at present is around 50 per cent.

Spang, Chalfant & Co., Inc., Pittsburg, are actively advancing extensive improvements to their iron and tube works a Etna, Pa. A new 2-bay steel building has been erected over the 16-inch bar mill and the puddling mills, replacing a former historic structure, and this department is already in operation. Another steel building is being raised 6 feet, remodeled and equipped with crane runways to cover a lapweld furnace making 4 to 12-inch pipe, which will be furnished by the United Engineering & Foundry Co. A new steel building is under course of erection and in it will be installed the present furnaces for making 1½ to 4-inch tubes and 3 to 6-inch tubes respectively, which are being remodeled and rebuilt by the company itself. When the improvements are completed, which will be by fall, the Spang-Chalfant company will have an equipment of six modern furnaces in its works, consisting of two butt-weld and four lap-weld furnaces. John Eichleay Jr., Co., Pittsburg, and Wm. B. Scaife & Sons Co., Pittsburg, have the contracts for the steel work required in the extensions. In addition to its mill improvements, the Spang-Chalfant company has also just completed the erection and has in operation a modern new power plant in which the power equipment of the upper and lower mills has been concentrated. The new plant is located upon high ground beyond the reach of the floods which are frequent occurences of the locality. It has about 1,100 kilowatt capacity. The pipe mill of the Spang-Chalfant company is one of the most historical plants in Pittsburg territory, the original part of the present extensive works having been one of the first plants of its kind erected west of the Allegheny mountains.

The Westinghouse Machine Co. reports good progress during recent months in the steam turbine business despite the general depression existing in the machinery market. While business has been considerably below normal, there have been many encouraging features in all directions of power application. Out of the most important business covering some 20 machines ranging in size up to 10,000 horsepower, the usual activity in

electrical, power and traction work is found, and a fair demand from various industries, including phosphate, cement and rubber mills, steel car works and oil refineries. Inquiry for exhaust steam turbines is active, and several equipments have been contracted for. The most important orders are as follows: Metropolitan Street Railway, Kansas City, 15,000 kilowatt; Narragansett Electric Light Co., Providence, R. I., 7,000 kilowatt; Capitol Traction Co., Washington, D. C., 3,000 kilowatt; B. F. Goodrich, Akron, O., 1,500-kilowatt; Tampa Electric Co., Tampa, Fla., 1,500 kilowatt; Colorado Springs Electric Co., 1,000 kilowatt; Pressed Steel Car Co., McKees Rocks, Pa., 2,000 kilowatt. In addition to these, there are equipments of 1,000 kilowatt and under for the Portland Cement Co., Denver; Coronet Phosphate Co., Plant City, Fla.; Bronx Gas & Electric Co., Westchester, N. Y.; Black Hills Traction Co., Deadwood, S. D.; Jacksonville Oil Mill Co., Jacksonville, Ala.; Fall Mountain Electric Light & Power Co., Bellows Falls Electric Co., Bellows Falls, Vt.; Tide Water Oil Co., Bayonne, N. J.; City of Logansport, Ind., and Bristol, Tenn., Gas & Electric Co.

Mackintosh, Hemphill & Co, Pittsburg, have just made shipment of a 40-inch blooming mill, mill tables and manipulator manufactured by them for installation in the McKeesport plant of the National Tube Co. The work of setting up the additional equipment is now in progress.

Woodlawn Light & Power Co., capital stock $5,000, has been incorporated by the following officials of the Jones & Laughlin Steel Co.: B. F. Jones Jr., Wm. Larimer Jones, Willis L. King, J. B. Laughlin and W. C. Moreland, all of Pittsburg. J. B. Laughlin is treasurer.

Union Water Power Co., capital stock $10,000, has been incorporated by the following: Jos. M. Waters, West Chillisquaque township, Northumberland county, Pa., Calvin A. Hare and Jeremiah W. Zeller, Lewisburg, Pa. Jeremiah W. Zeller is treasurer.

The Pittsburg Manufacturers' Power Co. is erecting a power building at Aiken avenue and the Pennsylvania railroad, Pittsburg, to supply light and power for light manufacturing purposes. A brick building 80 x 125 feet and six stories in height is being erected. The first floor will contain the power equipment and the five upper floors leased to manufacturing patrons. Steam power will be used. Bids are now being received on the equipment, and contracts will be placed soon. S. J. Purkers, 911 Farmers Bank building, is secretary and Frank J. Kleber, treasurer. The directorate includes besides Mr. Kleber, W. J. Stewart, of Pittsburg, and Albert Martin, Carnegie, Pa. A charter has been taken out under the laws of Pennsylvania.

SWANK RESIGNS

After Long and Able Service to American Iron and Steel Association.

The following letter to the president of the American Iron and Steel Association, by General Manager Swank, is self explanatory:

Office of the American Iron and Steel Association, No. 261 S. Fourth St., Philadelphia, December 31, 1908.

JOSEPH WHARTON, *President of the American Iron and Steel Association, Philadelphia, Pa.*

Dear Mr. Wharton:—I greatly regret that I am compelled to write you this letter, but there are some duties to ourselves and our friends that can not be indefinitely postponed. I have long wished to be relieved of the really arduous and exacting duties that have rested upon me in this office for many years. At the end of 36 years of continuous and undivided service as the executive head of this association, first as secretary, then as general manager, and during the last 22 years as secretary and general manager, I can no longer withhold the request that the members of the association will select at an early day a capable and worthy successor to me in the twofold position which I now hold in this office. In what manner this successor should be selected is not now clear to me, but I hope that the selection will not be long delayed. In the meantime I will continue as usual to care for all the interests of the association.

In 1900 I had reached the conclusion that more help was needed in our office, and in our annual statistical report appearing in that year, in the confident hope that this help would be provided, I said that succeeding reports would be prepared by another hand than my own. I wrote a number of letters at that time to leading members of our association urging the employment of an assistant to me in the general work of the office. But "what is everybody's business is nobody's business" and nothing was done.

By the constitution of the association, which was adopted in 1864, although the organization itself dates from 1855, it was provided that "the affairs of the association shall be conducted by a board of 30 managers, to be chosen annually by ballot, on the third Wednesday of November, by the members of the association. They shall continue in office one year, and until others are chosen, and shall have power to fill vacancies that may occur in their body. They shall from among their members, at their first stated meeting, elect a president, five vice presidents, and a treasurer." This arrangement was soon found to be cumbersome, and an executive committee of 12 members of the association was substituted. Of this committee I was made an ex-officio member in 1873, making me the thirteenth member. All the members are now dead except myself, and their places have not been filled. If this committee should be revived, it would be its duty to choose a secretary and general manager.

Not for your own information but for the information of those who may see this letter, I briefly mention the qualifications that I think are necessary in my successor. (1.) He should be a good protectionist and be able upon occasion to give a reason for his protectionist faith, with the courage to resist at all times the insidious or overt attacks of free traders upon our protective policy. (2.) He should be familiar with our tariff legislation. If possible he should have a large acquaintance among our public men who make the country's laws. (3.) He should be a politician in the best sense of the word, tactful and having the art of gaining and keeping the confidence of men worth knowing. (4.) He should have statistical instincts and accomplishments, by which I mean that he should be able to analyze and intelligently comment upon statistical details. (5.) He should be a ready writer, but also a judicious writer, so that he could edit the various publications of the association with good taste and without useless verbiage. (6.) He should also be a good proof reader and be familiar with the printing business, that the publications of the association may always be as free as possible from typographical, grammatical, and rhetorical blunders and be well printed. (7.) He should possess a knowledge of the iron trade, its many ramifications, its wants, and its technicalities; the more he knows of the last mentioned the better. (8.) He should be industrious and willing to give absolutely his whole time to the service of the association. Nothing less than his whole time could do justice to the vast interests confided to his care. (9.) Lastly, he should possess not only clerical ability but he should also possess business capacity, and, if possible, business experience. He should be economical. The association is not endowed. It is supported entirely by the voluntary contributions of its members, and reckless waste of money for any purpose would not be tolerated.

I cannot close this letter without expressing my grateful thanks for the cordial and effective assistance I have always received from you in the work of this office. This co-operation began long before you were elected in 1875 a vice president of the association, and it has continued without abatement until the present time. With best wishes for the new year and for all years I remain, Very truly yours,

JAMES M. SWANK, General Manager.

NOTE.—Owing to illness since the above letter was written Mr. Wharton's reply has not been received at the time this number of the *Bulletin* goes to press, but we know his views perfectly. Mr. Wharton will ask to be relieved of his duties as president of the association at the time my successor is appointed.

J. M. S.

SOME CONSIDERATIONS IN THE APPLICATION OF LOW PRESSURE TURBINES TO POWER GENERATION[1]

By James R. Bibbins.[2]

It is an interesting reflection bearing upon the truth of an old axiom that the commercial retrenchment of the past year has served at least one good purpose—to direct attention to a deserving but unappreciated factor in modern power generation—the low pressure steam turbine. And curiously enough, this approaches more closely to fact than most radical engineering developments to that commercial Utopia, "getting something for nothing." The entire potency of the low pressure turbine lies in its ability to utilize a waste product—exhaust steam—or to so improve the general efficiency of a power system as to force a thorough consideration of its possibilities and limitations.

The premise upon which your attention is engaged is the simple fact—well known among steam engineers—that both the standard types of prime movers, the reciprocating engine and the steam turbine, have distinct fields in which their highest efficiencies are respectively obtainable. Considering, step by step, the various stages of expansion of steam from the highest boiler pressure to the lowest condenser pressures, it is true that the steam engine finds its most efficient territory in the higher ranges above atmosphere, while the steam turbine works to best advantage in the lower stages. This, of course, does not carry the inference that the engine cannot benefit substantially from high vacuum, nor vice versa, the turbine from high boiler pressure, for the advantages of each are well known. But it results from the fact that the reciprocating engine utilizes the energy of steam by static pressure, the turbine by its conversion into dynamic force. In the engine, the losses due to condensation and re-evaporation on the cylinder walls during each consecutive cycle, are large; in the turbine there is no cyclic change, and, therefore, no such losses, comparatively speaking, as a fairly constant temperature and pressure obtains any given point in the expansion range.

In the engine, the mechanical friction of the enormous sizes of cylinders necessary to accommodate the lower expansion ranges, constitutes an effective barrier; in the turbine, the lower ranges are obtained with comparative ease and without incurring excessive losses mechanical or thermal.

A good Corliss engine, although operating condensing, will give the best efficiency[3] 72 per cent at normal load in the case discussed later when operating non-condensing, that is, against exhaust pressures of from 15 to 20 pounds absolute. Certainly cylinder ratios of one to 2.5 to 3.5 will do so. Similarly, the steam turbine expanding from 15 to 25 pounds absolute down will show a maximum efficiency ratio as high as 73 per cent for moderate vacuum. And commercial guarantees are today made above 70 per cent, a fact which speaks for itself. Thus, it occurs that the combination engine-turbine plant will show an over all efficiency ratio (65 to 75 per cent of ideal cycle) considerably in excess of either an engine or complete expansion turbine unit running alone, which can hardly do better than 65 per cent. In the case treated later, the Rankine cycle efficiency of the combined unit was found to be 69.3 per cent at normal load.

Owing to the excellent papers already presented before the various engineering societies on the general aspects of the subject, it is only necessary to consider here certain phases of the problem pertaining to the use of low pressure turbines in central power stations for lighting, traction and manufacturing. The pioneer work of C. A. Parsons (about 1890), has brought about so thorough a discussion of the marine problem as to take definite form in the recent decision to equip two Atlantic liners with combined engine and low pressure turbine plant. Prof. Rateau's work in steel mill and mine hoisting has also resulted in the practical application of low pressure turbines in connection with the steam regenerative principle, permitting the turbines to operate constantly, using the exhaust steam from engines intermittently operated. His work has been brought to our notice in this country by H. H. Waite in discussing regenerative turbine application to steel mills[4]. J. R. Kirkland[5] has introduced the subject of low pressure turbines in light and power plants. And it is this line of thought that it is desired to enlarge upon in the present paper.

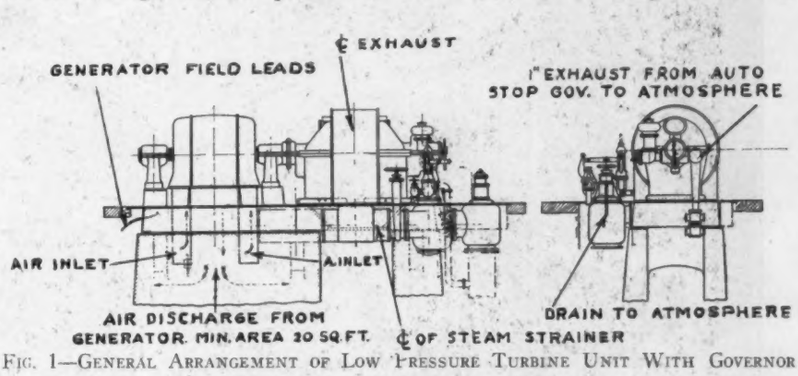

℄ EXHAUST
GENERATOR FIELD LEADS
1" EXHAUST FROM AUTO STOP GOV. TO ATMOSPHERE
AIR INLET
AIR INLET
AIR DISCHARGE FROM GENERATOR. MIN. AREA 20 SQ. FT.
℄ OF STEAM STRAINER
DRAIN TO ATMOSPHERE

Fig. 1—General Arrangement of Low Pressure Turbine Unit With Governor and Oil Relay Admission Valve.

Application.

There are two general classes of service in which the low pressure turbine finds effective field for application.

Class A:—Supply of steam intermittent and widely varying in quantity. For example: 1. Rolling mills, for blooms, plate, sheet, wire, rail and structural shapes. 2. Steam hammers. 3. Hoisting engines. All of these involve the regenerative principle, requiring a careful study of the time element in supply and demand—generally resolving into a special problem for each individual installation.

Class B:—Non-intermittent supply

[1]A paper presented before the Canadian Society of Civil Engineers, Montreal, Can.

[2]Westinghouse Machine Co., East Pittsburg, Pa.

[3]It is understood that the term efficiency in this case refers to efficiency ratio in per cent of Rankine-Clausius cycle; i. e., efficiency in per cent of available energy in the steam within the range of pressure, not steam consumption.

[4]American Institute of Electrical Engineers, December, 1907.

[5]National Electrical Light Association, June, 1908.

without regeneration. This class embraces central power stations for lighting, traction or for factory drives, and may be discussed as a general problem of power extension where the widely varying plant conditions may be summarized as follows: 1. Good engine design; fair operating efficiency. Increase in capacity necessary. 2. Inefficient engines, condensing or non-condensing; improvement in operating economy or increase in capacity necessary. 3. Present condensing plant unsuitable or inefficient. 4. Plant location—where water supply is limited, unsuitable or costly, e. g., enforced non-condensing operation. 5. High cost of fuel.

Given a reciprocating engine plant of serviceable construction, along what lines shall needed power extension be made?

1. By installing reciprocating units of the same type and operating under the same conditions. 2. By installing more efficient complete expansion turbines with suitable auxiliaries. 3. By utilizing the low pressure turbine principle to render the present plant more efficient.

Primarily, the problem before us is that of Case B 1 and 2, *improving the efficiency of a given reciprocating engine plant* which may be in the best physical shape but operating under unsuitable conditions. The importance of this subject will at once be appreciated when we reflect that a plant of non-condensing engines may be changed over to reduce its water rate from 30 or 35 pounds per kilowatt-hour to 15 or 18 pounds per kilowatt-hour in comparatively small sizes; in other words, for the same expenditure of coal and water, a net increase in power of from 80 to 100 per cent may be realized, depending upon the type of equipment, and the resulting cost of power is reduced in the same proportions. In the case later discussed, a minimum water rate of 15.8 pounds per kilowatt-hour (150-pound dry saturated steam to 28 inches vacuum) is obtainable from an engine giving 28.5 pounds per kilowatt-hour non-condensing, and 20.05 pounds per kilowatt-hour, condensing, with an increase in rated capacitly of 90 per cent —maximum 100 per cent. This is equivalent to 9.9 pounds per indicated horse-power, or an efficiency ratio of 75 per cent indicated, 68 per cent brake.

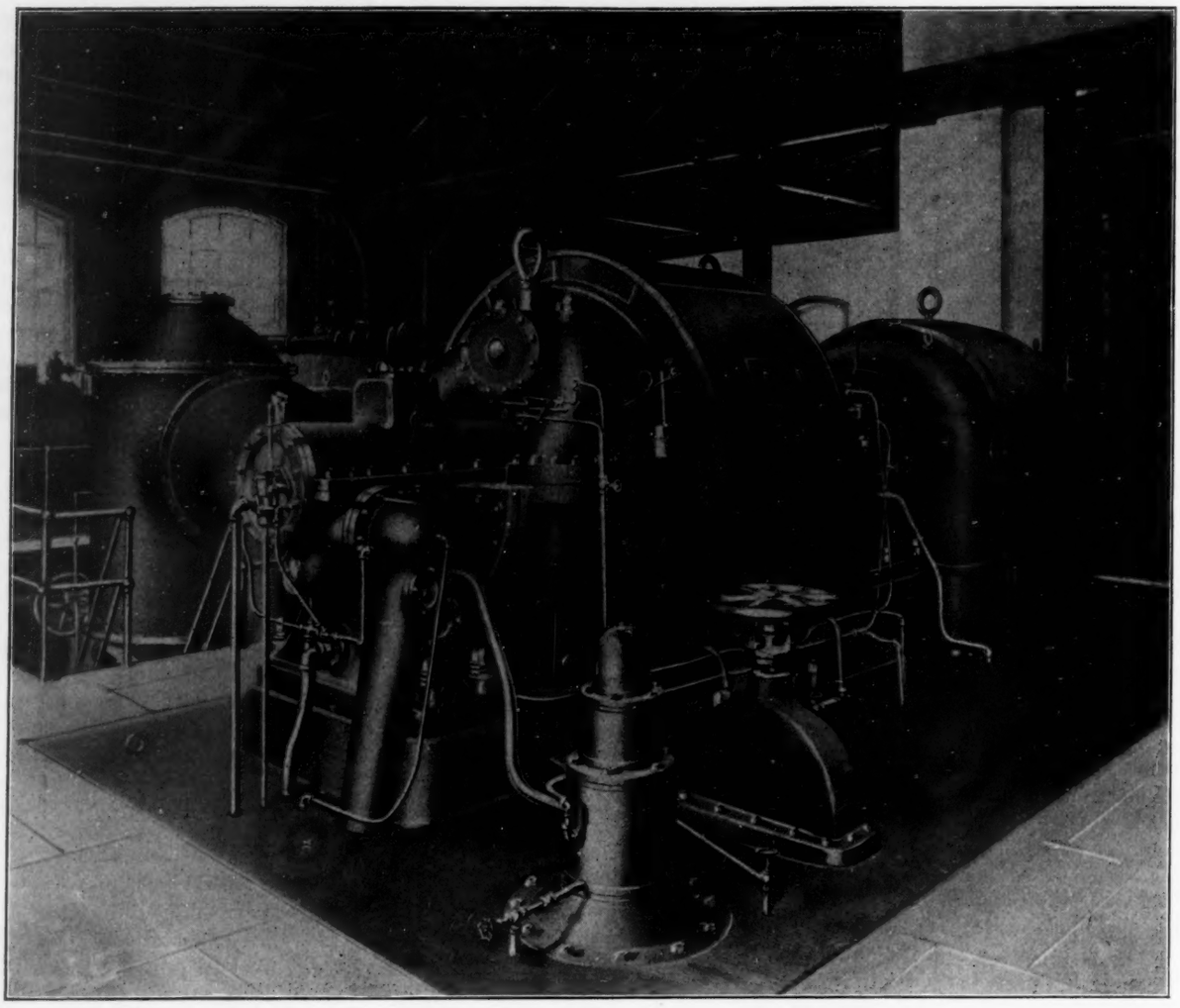


FIG. 2—INTERIOR OF POWER HOUSE OF UNITED STATES COAL & COKE CO., GARY, W. VA., SHOWING LOW PRESSURE TURBINE.

Turbine Tests.

Two series of tests[6] Figs. 3 and 4, will serve to illustrate the possibilities of economy and capacity:

Fig. 3 represents tests at several different loads and varying inlet pressures—all on approximatey dry saturated steam and 27.5 inches vacuum. Athough a few of the original obser-

[6]Owing to the author's special familiarity with developments at East Pittsburg, these data refer entirely to results obtained from Westinghouse apparatus.

vations were slightly irrational, this was due to the difficulty of maintaining exact vacuum, and when corrected fell well into line. Note that these tests, Fig. 3, were all conducted at inlet pressures below atmosphere, but the characteristic for higher pressures is the same—straight line—as has been proven by other tests carried as high as 30 pounds absolute. Thus, at 15 pounds inlet pressure, the water rate is approximately 23.6 pounds per brake-horsepower (33.2 pounds per kilowatt-hour) and at 20 pounds inlet pressure, about 21 pounds per brake-horsepower (30 pounds per kilowatt-hour).

The effect of higher inlet pressures and varying vacua is well shown by Fig. 4, a series of tests upon the low pressure section of a 2,000-horsepower lighting turbine built for the Interborough Rapid Transit Co. in 1902. This machine is of the single flow design, the high pressure section expanding down to about atmosphere and the low pressure section below. Note that the water lines are virtually straight up to the maximum initial pressure 30 pounds, and slightly divergent for varying vacuum. This range of inlet pressure represents quite closely the actual range of operation in a combined engine-turbine plan.t The result of tests on this machine, the first one of this type built for commercial service, shows an efficiency ratio of about 70 per cent at 15 pounds absolute inlet pressure and 27 inches vacuum. And this may be improved upon if it is considered expedient to design for higher vacuum.

Characteristics of Low Pressure Turbine.

From a thermodynamic standpoint, the low pressure turbine is the exact counterpart of the complete expansion turbine with which we are all familiar, and it possesses the same characteristics shown by Fig. 4. As in the high pressure turbine, the line of total consumption per hour, or water line[7], is practically straight, resulting in a constantly decreasing water rate curve. The power developed by this machine increased in proportion to the inlet pressure, barring the small friction drop throughout the machine at no load. As this type of machine employs no mechanism in the shape of overload or secondary valves, this would be expected, and the water rate curve is necessarily an equilateral hyperbola. The low pressure turbine may be regarded as the third cylinder of a triple expansion system, and is equivalent to such cylinder fitted with *fixed cut-off*. In other words, it must have a definite initial pressure to enable it to pass a given weight of steam. This necessitates a careful study of engine cylinder proportions and valve movements. For it occurs that when direct connected to an engine, the release pressure in the low pressure engine cylinder may be well above the initial pressure required by the turbine, or considerably below it, depending upon whether the load is heavy or light. In the first case, a large receiver drop would ensue between engine and turbine, and in the second, a serious loop in the low pressure card. Hence, the type of engine, cylinder ratio, the cut-off and the average and maximum load demand must be known before any rational decision can be made as to the proper size of turbine to install and the resulting distribution of load predicted. However, should errors be made in the calculations or determinations of the low pressure turbine characteristics, the same can be easily rectified by a slight change in the angle of the blades, requiring but a very small expenditure.

[7]Sometimes called the Willans law.

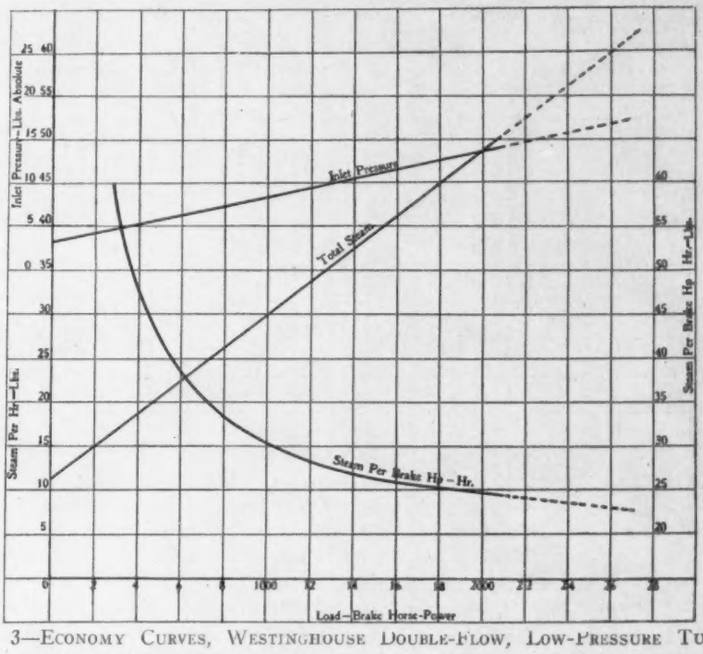


FIG. 3—ECONOMY CURVES, WESTINGHOUSE DOUBLE-FLOW, LOW-PRESSURE TURBINE WITH VARYING INLET PRESSURES DESIGNED FOR 15 POUNDS ABSOLUTE PRESSURE AND 27.5 INCHES VACUUM.

Engine Characteristics.

Assuming a normal design of Corliss compound engine, there are two methods of governing, which may come under consideration: *a* High pressure cut-off variable; low pressure fixed. *b* Parallel cut-off; i. e., both high pressure and low pressure variable in the same direction—increasing with the load.

The parallel system is widely employed in Corliss practice to maintain an equalization of work in the two cylinders. It is difficult, however, to avoid loops in the low pressure cards at light loads (non-condensing), as the low pressure cylinder expands below the exhaust pressure. In case *a* the low pressure cut-off is deliberately fixed far enough in advance to eliminate the low pressure loop in the lower ranges of loads anticipated. But this system has the disadvantage of causing a great disparity in the loading of the cylinder.[8]

A point worth noting is that in lightly loaded plants where large increase is anticipated, the low pressure loop may be to some degree avoided by omitting a few rows of turbine blades, thus enabling it to pass the same quantity of steam at a lower inlet pressure. Ordinarily, two rows will be sufficient, and these may be replaced later when normal operation is resumed.

This brief discussion will serve to illustrate the necessity of a careful study of the engine problem. In designing a plant for a given loading factor—say 75 per cent average, 150 per cent maximum rating—the point of rating of the combined unit may be regarded as corresponding to the point where the engine is operating at its best economy, non-condensing. For the combined plant

[8]Thus with low pressure cut-off fixed at 75 per cent of stroke and the high pressure as short as 15 per cent, the engine would deliver steam to the turbine at eight pounds, absolute and without loop. But on maximum load with high pressure cut-off at 75 per cent and 25 pounds back pressure, the ratio of work in the two cylinders would be about 2 to 1.

virtually retains the characteristics of the engine equipment.

Combined Plant.

The effect of the various factors above outlined may be best illustrated from Figs. 6 and 7, which have been prepared to exemplify the principles of design for a 2,000-kilowatt installation suited to a 50 per cent overload, or thereabouts. Fig. 6 shows only the water lines, from which are derived the respective water rate curves, Fig. 7. These water lines cover the following conditions: *a* Engine alone condensing, 26 inches vacuum; *b* engine alone non-condensing, 17 pounds absolute back pressure; *c* low pressure turbine alone, 28 inches vacuum, variable inlet pressure; *d* engine non-condensing with variable back pressure, resulting from its connection to the turbine; *e* combined engine and turbine system, 28 inches vacuum.

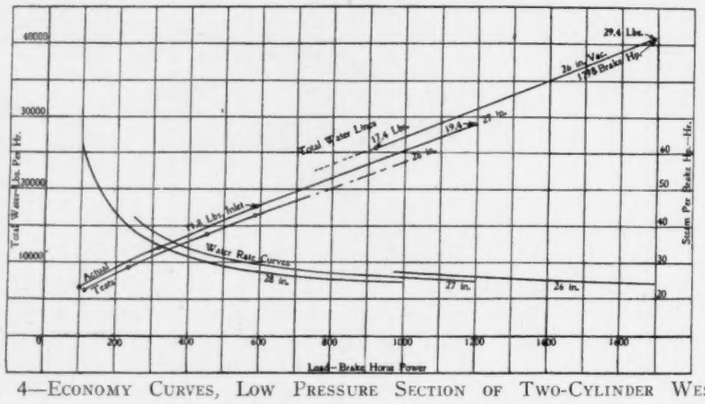


FIG. 4—ECONOMY CURVES, LOW PRESSURE SECTION OF TWO-CYLINDER WESTINGHOUSE-PARSONS SINGLE FLOW TURBINE. CURVES SHOW EFFECT OF VARYING VACUUM AND HIGH INLET PRESSURES.

Of the above *a*, *b* and *c* were obtained by actual data. The combined curve *d* must be found graphically from the characteristic curves of engine and turbine, and the final curve *e* by combining *c* and *d*. These water lines, Fig. 6, serve to illustrate the difference between the "Willans" characteristic for turbine *c* and an engine *a*, *b* governed by cut-off. One is a straight line, the other a curve. The turbine has no point of lowest water rate other than maximum load; the engine ordinarily does it best at rating or under. It is usual practice to rate an engine at its point of lowest steam consumption. This may be found from the water lines as the point of tangency of a radial line from the origin. Thus, this engine running condensing shows its best economy at about 1,000 kilowatts, and non-condensing at about 1,200 kilowatts, which is entirely rational. On the other hand, the resultant engine curve *d* shows a best point of economy slightly under 900 kilowatts, due to the influence of the variable back pressure. Therefore, the turbine should be designed to pass just the amount of steam required at a back pressure corresponding approximately, to this point of best engine economy, non-condensing; care must be taken, however, in adapting the turbine to the engine, to avoid any condition that will cause excessive pressures on engine crank pins and bearings.

This point of safe pressures is mentioned because of a tendency to permanently overload the engine in the desire to produce a very low water rate. It should not be considered good practice to operate an engine on pressure much in excess of 50 per cent over that for which it was designed.[9] A recent study of a combined plant that has been widely discussed, shows that the engine had been forced to a mean effective pressure of 56 pounds referred to the low pressure cylinder. In our typical study, Figs. 6 and 7, it has been thought best to take an engine of normal proportions, as found in many lighting and traction plants (cylinder ratio 1 : 3.75) rather than a ratio suited to efficient non-condensing operation; e. g., 1 : 2.5 or 1 : 3. Hence the results may be considered conservative in this respect. The design is based on: 1. An engine rating (best) of about 33 pounds mean effective pressure referred to low pressure cylinder, 165 pounds absolute boiler pressure and 17 pounds absolute back pressure. 2. Allowing one pound drop between machines—a turbine passing the engine steam at 16 pounds inlet pressure, 26 inches vacuum. The combined plant, 2,000 kilowatts, has an overload capacity of 50 per cent with some excess margin.

Examining the water rate curves, Fig. 7, we find that the engine gives an economy of 20.05 pounds per kilowatt hour condensing, 28.31 pounds per kilowatt-hour non-condensing, for a normal load of 1,000 kilowats in each case; but in combination with the turbine, a maximum water rate of 15.8 pounds per kilowatt-hour. Curve e^1 Fig. 7, has been derived from curve *e* for comparison water rates of the combined plant and condensing engine on the same basis of rating; i. e., equivalent to curve *e* at half scale. Thus, at rating, the combined plant shows an improvement of 22 per cent in water rate. At light loads, however—500 kilowatts—the combined plant ceases to be as efficient as the engine running alone condensing. The point of true economy is, of course, somewhat variable, as it is difficult to locate it accurately with two curves at such an acute angle; but it immediately suggests that in the practical operation of a combined plant, it would be desirable to shut down the low pressure turbine when the load falls below 30 per cent rating, for example, and operate the engine alone.

Governing.

For a study of governing the various classes of service may be summarized as follows:

Class A:—Turbine electrically locked with engine; that is, serving the same bus bars; 1, turbine taking all of the engine steam. No governor required. Load on turbine varies with engine load; 2, turbine taking part of the engine steam. No governor required. Output remains practically constant with uniform pressure in exhaust mains due to excess supply of exhaust steam.

In both of the above cases atmospheric relief should be provided if only to enable the engine to operate while the turbine is shut down, and, of course, a hand throttle valve.

Class B:—Turbine electrically independent of engine, that is, serving separate bus bars; e. g., lighting only, engines on traction bus; 3, turbine taking all or part of engine steam. Governor required in case of intermittent supply.

With momentary deficiencies occurring only infrequently a reducing valve must be used for auxiliary live steam supply, also in case of deficiencies of long duration; but with rapidly fluctuating supply averaging in excess of the demand, a regenerator may become profitable, or its equivalent in electrical storage may be used in direct-current systems.

In all of these cases a safety stop is obviously essential, simply for insurance

[9] In average practice, a compound Corliss engine (condensing) would be designed for about 30 pounds mean effective pressure at rating, and should not operate with a mean effective pressure much over 45 pounds (referred to low pressure cylinder).

against possible overspeeding. In Class A, 2, for example, should the circuit open with the turbine under load, the safety alone would prevent disaster. The automatic safety stop may operate either a butterfly valve or a positive closing throttle.

Gary, W. Va., Installations.

A typical example of low pressure turbine application is found in the plant of the United States Coal & Coke Co., Gary, West Va. It operates the mining property, serving hoists, pumps, blowers, lights, etc. The plant contains two 24 x 44 x 42-inch Corliss engines, 750-kilowatts, one 1,000-kilowatt complete-expansion steam turbine and a 1,000-kilowatt, low-pressure steam turbine, both of the Parsons type. These turbines are served by three cooling tower units, fan-driven, each 24 feet in diameter and 25 feet high. Two of these units serve the low pressure turbines and one the high pressure turbine. The following figures roughly indicate the normal operation of the generating units from readings taken Oct. 7, 1908:

Output of two Corliss engines	1,400 kilowatts
Output of low pressure turbine	1,200 kilowatts
Steam pressure (gage)	150 pounds
Vacuum, low pressure turbine (referred to 30 inches)	25.8 inches
Temperature of injection	88 degrees
Temperature of air	85 degrees
Cooling in tower	31 degrees

Thus the low pressure turbine carried nearly half the total load on less than 26 inches vacuum, and would have carried over 1,500 kilowatts on 28 inches vacuum with better condensing conditions.

Auxiliaries.

Inasmuch as the turbine is so dependent upon auxiliaries, it is pertinent to point out some facts in this regard. If we compare the ideal water rate of a turbine expanding from atmosphere down to various vacua, we shall find that, while the ideal machine improves continuously down to the lowest condenser pressures, the actual turbine cannot make as good use of the last inch or two of vacuum, as in other parts of the expansion range; in other words, we may expect the highest efficiency in moderate ranges of vacuum. This is in entire agreement with high pressure turbine work, as the author has endeavored to point out many times before. However, assuming that the turbine improves 5 per cent per inch of vacuum around 27 inches, it is plain that an efficient condenser is very desirable, but with warm circulating water, it is not always possible to obtain the vacuum desired. This is due almost always to the inability of the condenser to work with a small enough temperature difference between steam and discharge water. A condenser may be regarded as a heater and its effectiveness is entirely dependent upon its ability to deliver water heated as near as possible to the temperature of the steam. This is of the utmost importance in plants where cooling towers are necessary. And at this point may be emphasized the fact that the cooling tower is rapidly receiving the recognition it deserves. This

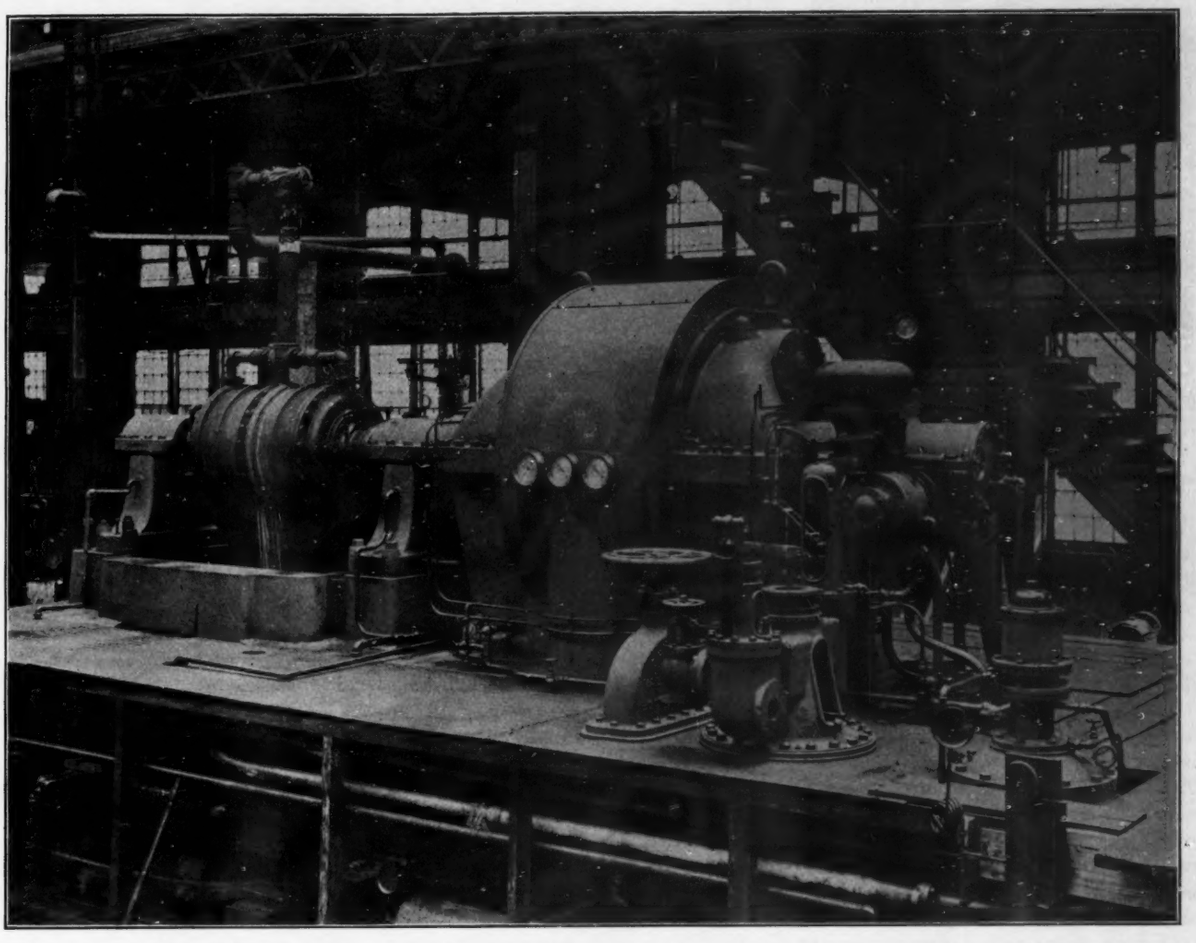


FIG. 5—1,000-KILOWATT WESTINGHOUSE DOUBLE-FLOW, LOW-PRESSURE TURBINE UNIT ON TEST FLOOR, FITTED WITH GOVERNOR AND OIL RELAY ADMISSION VALVE, ARRANGED FOR BRAKE LOAD TEST.

has been brought about by the recent development of more efficient condensing apparatus.

A good surface condenser should operate at least within 15 degrees difference between the temperature of the steam and discharge water; a good barometric jet, within 10 degrees, yet we find that twice this difference is tolerated in modern power plants as supposedly good performance. This is the secret of the poor vacua against which turbine builders are obliged to struggle to design machines for better conditions.

There are now on the market, condensers of the jet type, which are able to operate within two to five degrees practicable amount of water—140 volumes.

The more efficient jet type is thus responsible for reducing the quantity of cooling water to one-third of that required for the average surface type.

In cooling tower practice, where extra power is required to lift these large volumes, this is evidently of the highest importance, for the increase in auxiliary plant may more than offset the benefits of the increased vacuum. Therefore, the determination of the most economical vacuum for a given plant involves a study of the plant economy at various vacua, the power consumption of auxiliaries and the operating and fixed

exceedingly flexible, and may work into an existing engine plant of good, as well as poor design, to advantage, in conjunction with engines of high as well as low expansion ratio.

2. Regenerative accumulators are not always essential in low pressure turbine work; in fact, average power plant work does not require their use, resulting in maximum simplification of plant.

3. It is important to choose the proper turbine size so as to permit of good economy in the engine and maintain exhaust pressures above atmosphere during normal loading, thus preventing air leakage in valves and piping.

4. During periods of light loads, it

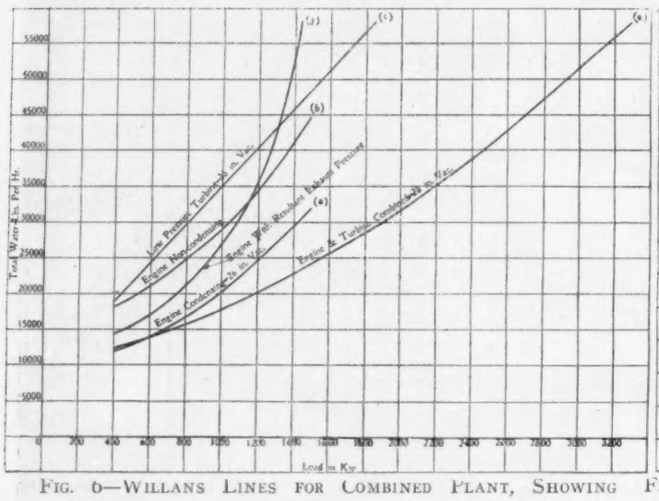

Total Water Lbs. Per Hr.
Load in Kw
Low Pressure Turbine—28 in. Vac.
Engine Noncondensing
Engine With Resilient Exhaust Pressure
Engine Condensing—26 in. Vac.
Engine & Turbine Condensing—28 in. Vac.

FIG. 6—WILLANS LINES FOR COMBINED PLANT, SHOWING METHOD OF OBTAINING STEAM CONSUMPTION FOR A GIVEN SET OF CONDITIONS.

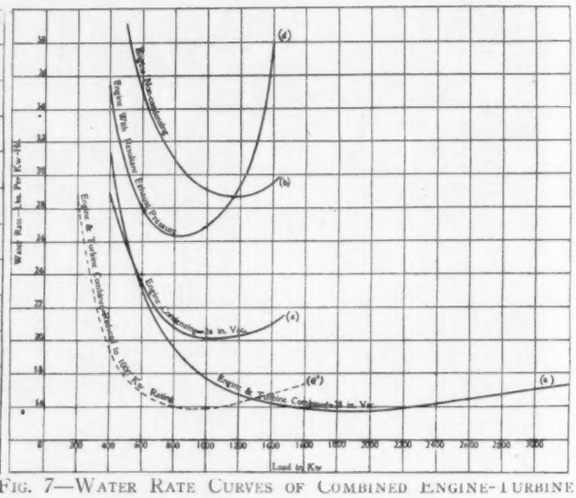


FIG. 7—WATER RATE CURVES OF COMBINED ENGINE-TURBINE PLANT DERIVED FROM FIG. 6, SHOWING DIRECT COMPARISON OF COMBINED PLANT WITH CONDENSING ON BASIS OF EQUAL RATING, CURVE G.

of the steam temperature and without unusually bulky or wasteful auxiliaries. This considerably reduces the quantity of cooling water necessary to condense a given amount of steam; in other words, makes possible a higher vacuum with a given temperature of water. For example, assuming a cooling tower able to cool down to the temperature of the air, what vacuum will it be possible to maintain with water at 75 degrees Fahr.? A perfect condenser with no temperature difference between steam and discharge water would require about 220 volumes of cooling water for 29 inches vacuum. For 28 inches vacuum it would require 35 volumes. An efficient condenser of the jet type, working within 5 degrees of the steam temperature, can maintain 28 inches with 43 volumes of water. An ordinary jet condenser, working on 10 degrees difference, will require 57 volumes to maintain 28 inches, while the ordinary surface condenser, working for 20 degrees difference, could not maintain 28 inches, except by using an im-

charges against the auxiliary plant. This becomes more and more important as condensing conditions become more unfavorable.

It is important to deliver steam to the turbine as dry as possible, owing to the well known effect of moisture in decreasing the output through friction. The quality of steam from the engines is, of course indeterminate, but varies between wide limits—averaging 93 to 90 per cent, or less, so that a separator had best be installed in the exhaust main before the turbine. This also serves to remove the water of condensation from a long run of exhaust piping. This necessity suggests the use of a moderate superheat in the engine, sufficient to insure dry steam at the turbine—entirely feasible with the internal type of superheater in common use.

Summary.

The most important thoughts presented in the preceding, may be summarized thus:

1. Low pressure turbine application is

may be expedient to run the engine condensing, omitting the turbine entirely.

5. For infrequent or long-continued deficiencies in the steam supply, the turbine may take live steam through a reducing valve to supplement the normal supply.

6. The inherent efficiency of both turbine and combined plant is greatest at moderate vacua—70 to 73 per cent of the ideal steam cycle.

7. The condenser problem lies largely in its ability to work on small temperature differences.

8. The weight and cost of the low pressure turbine unit are not far from that of the complete expansion unit. The length of turbine will be reduced about 30 per cent, that of the complete unit about 18 per cent.

9. No governor will be required if the turbine is electrically connected to the engine and takes all or part of the steam.

10. An efficient safety overspeed stop is a vital necessity.

MANUFACTURE OF STEEL CASTINGS IN SMALL QUANTITIES[1]

Using a Converter of 1000 Pounds Capacity, by the New Tropenas System

By Arthur Simonson.

The fact that we are now able to procure, in many steel foundries, castings of good quality has resulted during the course of the past 20 years in a great transformation in construction in general, and in mechanical and metallurgical construction in particular. Heavy and massive pieces are made in the open-hearth furnace, and medium and small pieces in the converter. The open-hearth has played its important part in the development of the now extensive steel foundry business, but it is principally the small converter which has been the principal factor, on account of its more easy adaptation to all the details of miscellaneous manufacturing, its elasticity of production and its cost.

The Converter.

The converters generally used in the steel foundries have a charge capacity varying from one to three tons. The two-ton converter which is convenient for the manufacture of pieces of all weights, from one pound to ten tons, has been the one most generally employed, by the smaller foundries as well as by those of larger production. The 1-ton type, of which the cost of installation is little less than that of one of two tons capacity, has been little employed.

Since the marvelous invention of Bessemer, numerous metallurgists have tried to adapt the principle of his pneumatic process to a type of converter of very small capacity, capable of producing steel castings which may be substituted on the one hand for ordinary cast iron, which is too fragile, and on the other hand for forgings, which are too costly.

History of the Pneumatic Process.

It was Daniel Adamson, who, by his first researches in 1864 on lateral blowing with multiple tuyeres, opened the way which was followed by numerous experimenters until 1884, the period of fixed converters, which was characterized by the work of James P. Witherow, William J. Clapp and Thomas Griffiths, whose processes were used with more or less success for a considerable period. Then followed Charles Walrand, who applied the blast to one side of a movable converter, served by tuyeres of large section.

Robert, by adopting the Walrand principles, arrived at an approximate solution of the problem of the manufacture of mild steel castings direct from the converter, about 1880. The Robert converter met with an encouraging success. It permitted the manufacture of good steel, and was used in a number of foundries. The apparatus is movable; it is fitted with a small number of tuyeres of large section, arranged on one of the sides, which is straight; the compressed air acts through the metallic bath and near its surface, maintaining a gyratory movement which stirs the metal during the blow.

In 1890, A. Tropenas established the new principle of blowing above the surface of a deep bath, to avoid the violent stirring considered by his predecessors as the indispensible condition of successful pneumatic operation.

Tropenas Converter.

This new Tropenas converter was much discussed from the moment of its appearance by metallurgical writers who did not attempt to disguise their disdain for a process in which one of the principles taught by them was so outrageously violated. The steel obtained by this process which avoided the irregularities of the other methods, gave results of such a nature that the specified requirements of war and navy departments, railroad companies and consequently the general industries were fully met. It was then installed by numerous establishments in the United States and foreign countries. The English, Russian and Japanese governments adopted it in their arsenals for the manufacture of special sections. The United States government installed it in five navy yards. It was, with few exceptions, the 2-ton converter which was adopted in these numerous steel works.

Small Converter.

The cost of a 2-ton Tropenas installation, while much less than that of a Bessemer plant of the same capacity, represents an important investment which cannot be made except by establishments possessing sufficient capital.

Many small foundries, for which the addition of a small steel department would be a most valuable complement, recoil from the expense. So the question has often been asked if it were not possible to bring out a type of converter which, instead of two tons, would be able to treat charges of 1,000 pounds only, employing high pressure blowers instead of the too costly blowing engines, with the power apparatus and accessories reduced and proportioned to the smaller charge. The importance of the solution of this problem to the small metallurgical industry was appreciated, but the different attempts that had been made with converters of very small capacity had not given sufficiently conclusive results to recommend them.

However, since 1890, several engineers have constructed different types of converters with greatly reduced charges, but the results have given very little encouragement. It is very difficult to effect pneumatic refining conveniently when operating on a small mass of metal.

Refining Small Charges.

For a pneumatic refining of a small charge it is necessary for the heat developed by the oxidation of the elements of the iron to raise the temperature of the bath rapidly to a high point, and that the temperature continually increase until the end of the operation.

In the treatment of a small charge, the loss of heat, by comparison to the mass, is very high, and the least error or the smallest negligence on the part of the operator leads to an irregular and tumultuous blow, which produces a steel of bad quality, or too cold to be handled for the ordinary purposes of a steel foundry.

For a small converter to respond to the requirements of the small metallurgical industry it is necessary:

1. That the steel obtained at the end of the blow be at a high temperature; that it be very fluid and that it retain that fluidity long enough to be distributed in small ladles and cast without haste or precipitation into

[1]A paper read at the January, 1909, meeting of the Philadelphia Foundrymen's Association.

the molds which have been prepared.

2. That the mild steel obtained be of an entirely regular quality, and entirely deoxidized, to produce sound pieces, when the molds have been properly prepared.

3. That the mechanical results obtained meet the conditions demanded by the governments and railroad companies.

4. That the refining method be so simple that it can be comprehended in a few weeks by any intelligent workman.

5. That the expense of the installation be not too high.

The numerous experiments made under the direction of Mr. Tropenas have permitted the realization of this type of small converter, which solves in an absolute and complete manner the problem of the manufacture of steel castings in small quantities by the pneumatic process.

The small converter is not intended to supersede the 2-ton vessel which is now used, when the amount of castings averages 100 tons per month or more, but it may be a valuable complement for a cast iron or brass foundry, or for a construction firm which desires to be independent of the large steel foundries.

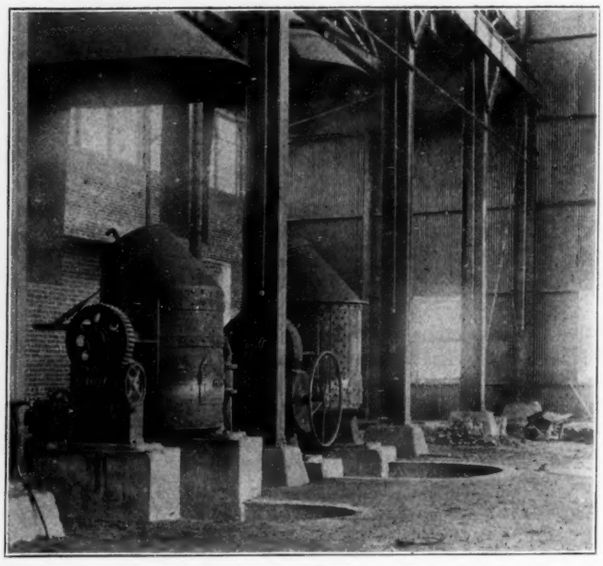
Necessary Equipment.

The necessary equipment for this process is as follows:

A cupola of special design, to melt the iron which is to be refined in the converter, and a special low pressure blower to serve this cupola; a special converter in which is charged the iron previously melted in the cupola; a special high pressure blower designed to produce the compressed air for refining the iron in the converter; a small crucible furnace in which is melted the final addition used to reduce the oxidation of the metallic bath; the necessary motors for driving the cupola and converter blowers and the accessory apparatus; cranes for handling the casting ladles and molds; the materials and tools generally employed in all foundries, including flasks, drying stoves, annealing furnaces, molding material, etc.

If a steel department is to be added to an iron foundry it should be separated entirely from the latter to avoid the mixture of the pig iron and scrap.

FOUNDRY OF THE TROPENAS STEEL CO. AT NEWCASTLE, DEL., SHOWING CUPOLAS AND HALF-TON AND TWO-TON CONVERTERS.



TROPENAS STEEL CO., NEWCASTLE, DEL., HALF-TON AND TWO-TON CONVERTERS.

Analysis of the Iron Used.

The iron used is of the low phosphorous grade and the analysis limitations follow:

	Per cent.
Carbon	3.80 to 4.50
Manganese	0.50 to 2.00
Silicon	1.80 to 3.00
Sulphur	Maximum 0.05
Phosphorus	Maximum 0.06

Carbon.—The carbon is not an element of prime importance and may vary between limits greater than those indicated above.

Manganese.—The manganese may also vary between limits a little more than those of the table above, but it may result in the rapid wearing of the lining.

Silicon.—The proportion of pig iron entering into the charge for the cupola should be regulated by the quantity of scrap, gates and heads which it is desired to utilize. As a general rule it is good practice to use all or the greater part of the scrap, gates and heads which are produced in the steel foundry. The greater the proportion of scrap used, the greater must be the percentage of silicon in the pig iron used.

Operation of the Converter.

The mixture of pig iron and scrap is melted in the cupola, then tapped into a ladle which is lifted to the level of the mouth of the converter placed in the charging position, and its contents are poured into the vessel. The converter is then placed in the blowing position and the blast is admitted through the tuyeres. This operation is pursued up to the point of the complete transformation of the pig iron into steel. It lasts about 15 to 20 minutes according to the nature of the iron treated. The conduct of the operations is exceedingly simple and any intelligent workman can become a good operator in a short time.

Adding the time of blowing to the time of casting, the complete operation requires about 35 to 40 minutes. Counting five minutes for charging the converter, it is possible to make a complete operation, or to produce about 1,000 pounds of steel every 45 minutes; that is to say, in a working day of 10 hours, one can make and cast 12 heats of 1,000 pounds each,

and produce approximately six tons of steel.

Cost of Production.

Taking as a basis the output given above, and supposing that a small steel foundry casts twice a week, we shall obtain the cost of the steel in the ladles as detailed below, which is verified by experience. The loss due to the melting in the cupola and the refining in the converter is from 15 to 18 per cent. In making the above calculation we have used 18 per cent so as to be on the safe side; but the total loss, which varies according to the analysis of the pig iron is, on the average, smaller. This, therefore, makes necessary in our calculations a total of 15,600 pounds of the mixture of pig iron and scrap for a net production of six tons of liquid steel, taken as the basis of the cost of production, the mixture melted in the cupola being composed of two-thirds pig iron and one-third scrap.

COST OF PRODUCTION.

10,400 pounds pig iron at $21 per ton	$100.10
5,200 pounds steel scrap at $15 per ton.	41.25
2,030 pounds coke for cupola at $4 per ton	4.10
620 pounds limestone at $2.50 per ton	0.80
One man and helper for cupola	4.00
7½ horsepower for cupola blower at five cents per kilowatt hour	2.80
1,100 pounds coke for converter and crucible	1.80
30 horsepower, three hours, for blower, five cents per kilowatt hour	3.40
One man and helper on converter	4.50
793 pounds ferro-silicon at $28 per ton	11.10
112 pounds ferro-manganese at $45 per ton	2.52
Aluminum	0.70
Linings for cupola and converter	5.00
Crucibles	2.50
Power for elevator and tilting converter	1.10
General expenses of manufacturing	25.00
Total	$210.67

Thus the price of the liquid steel ready to be cast into the molds is in the neighborhood of 1.60 cents per pound. This price does not include the general fixed charges of the enterprise, nor the interest on the capital invested.

Quality of the Steel.

The steel coming out of the converter being very hot and fluid, it is possible to cast pieces of very small size and extremely light weight. If the molds are well prepared and the sand of proper quality, the castings produced are clean and have a good exterior appearance.

The greater portion of the castings are made of soft steel which is almost exclusively specified by engineers. The test pieces tested by different customers at the foundry where two of these small converters are in operation, have given the following results on the usual soft grade of machine castings.

This cast steel forges like mild rolled steel without taking more than ordinary precautions. It welds as well in a forge fire by taking the same precautions ordinarily used. This feature permits the casting of complicated pieces in parts which are afterwards welded together.

Compared to an open-hearth furnace of small capacity this converter has the advantage of being much more elastic, and it accommodates itself to intermittent use. When the converter is stopped all consumption of power and fuel ceases, but in the case of the open-hearth one is obliged to keep up the fire after melting. The steel produced is hotter and more fluid than that produced in the open-hearth, and consequently produces less skulls. The steel made in this converter is of the same quality as the steel obtained from converters of greater capacity. The mechanical results do not show any difference. The blows are easy to manage, the periods are sharply and clearly defined, and the signs which indicate the finish of the reaction are clearly marked.

QUALITY OF STEEL.

Test pieces.	Tensile strength per square inch, pounds.	Elongation, inches.	Reduction of area, per cent.	Remarks.
A 17	61,520	19.40	43.70	Fibrous
A 19	62,830	17.09	39.20	Granular part fibrous
A 20	65,455	18.49	47.20	Fibrous
A 21	64,436	16.95	33.60	Fibrous
A 23	62,713	17.48	38.50	Granular part fibrous
A 25	65,294	20.14	44.20	Fibrous
B 110	71,359	21.08	43.60	Fibrous granular
B 112	75,572	20.41	39.14	Fibrous granular
B 115	74,617	22.17	40.26	Fibrous granular
B 117	72,972	23.45	35.61	Fibrous granular
B 120	77,733	19.90	34.80	Fibrous granular
B 121	77,049	19.85	36.56	Fibrous granular

MOTOR-DRIVEN SHEARS IN THE SCRAP-SORTING SHED OF THE SEATTLE STEEL CO.

The unorganized condition of the scrap iron market on the Pacific coast makes a scrap-cutting and sorting shed an essential adjunct to every far-western rolling mill. The scrap-sorting shed at the mill of the Seattle Steel Co., at Youngstown, near Seattle, Wash., lies parallel to the main mill shed, separated from the latter by an alley about 15 feet wide. In the shed are installed seven scrap-cutting shears of various sizes. Originally these shears were driven by three isolated vertical steam engines supplied with steam from the waste-heat, porcupine boilers situated about 75 feet from the nearest and about 175 feet from the most remote engine. Recently the old steam engines have been discarded and electric drive substituted. Data are now available on the comparative performance of the two drives.

The shears are arranged in a row along the east side of the scrap shed. All the motors are of the two-phase, 60-cycle induction type operated on a 220-240-volt circuit. The power equipment of the shears, taking them in order from south to north, is as follows:

One 10-horsepower motor, 1,200 revolutions per minute, is belted to a 24-inch plate shear.

A 30-horsepower, 900-revolution-per-minute motor is belted to a 36-inch rail shear, built by the Mesta Machine Co. A 9-inch belt is used. A 12-inch pulley fitted to the motor shaft drives a 30-inch pulley on the countershaft, while a 15-inch pulley on this shaft, in turn drives a 46-inch one on the pinion shaft of the shear. The gear ratio of the shear is 16 to 127. Therefore with the motor running at 900 revolutions per minute the shear operates at 15 cutting strokes per minute. In spite of the tremendous leverage this gives the motor it was found that it would not start the heavy shear successfully and a friction clutch was inserted so the motor can be started and brought up to speed light. Formerly the shear was driven by a 14 x 24-inch, simple vertical steam engine direct-connected to the pinion shaft of the shear. This engine developed 18 indicated horsepower when shearing 65-pound steel rails. To allow for engine friction and belt losses, as well as to prevent stalling, a 30-horsepower motor was installed.

A 20-horsepower, 1,200-revolution-per-minute motor, through the usual arrangement of line and countershafting, drives three small light rod shears arranged in a row adjacent to the rail shear. These were driven by a 10 x 15-inch vertical automatic engine, which developed 11 indicated horsepower when driving two shears.

A 25-horsepower, 720-revolutions-per-minute, motor is belted to a 24-inch heavy and an 8-inch light rod shear, formerly driven by a 7 x 13-inch vertical engine which developed 20 indicated horsepower when driving both shears. When the above indicator cards were taken the shears were operated at the limit of their capacity.

The electrical equipment was all furnished by Fairbanks, Morse & Co., and the current is supplied by the city of Seattle. The rate for power is from 1¼ to 2½ cents per kilowatt-hour, depending on the maximum demand.

The comparative cost of the two kinds of power on a basis of indicated horsepower actually consumed is interesting. It is assumed that the internal friction of the engine about equals the additional belt losses incurred by the motors, so that the indicated horsepower of the steam engines represents with fair accuracy the brake horsepower delivered by the motors. The three steam engines indicated 49 horsepower and consumed about 2,450 pounds of steam per hour at the rate of 50 pounds per indicated horsepower hour. The steam was very wet when it reached the engines. The entire installation was consuming the equivalent of 12 pounds of coal per horsepower-hour, which at $4.00 per ton made the hourly cost of fuel $1.17 or 2.39 cents per horsepower-hour, equivalent to 3.2 cents per kilowatt-hour. At the normal rate of 2.0 cents per kilowatt-hour this same power is furnished by the motors, allowing a motor efficiency of 75 per cent, for $1.00, a saving of nearly 15 per cent over the cost of steam power. In addition to this must be considered the convenience and decreased labor cost of the motor drive, for under the old system when the mill was shut down and the scrap-cutting shears were operating a boiler had to be fired specially to furnish steam to operate the shears.

CHEMICAL SPECIFICATIONS FOR FOUNDRY IRON[1]

By Geo. C. Davis.[2]

Recently my attention has been called to so many complaints of the pig iron specifications drawn up by purchasers that I thought it worth while to collect what facts I could and find if possible where the trouble lay. It is generally agreed that chemical specifications for iron are superior to the old method of grading by fracture. That being the case, it remains to draw up some scheme that is generally recognized. The blast furnace representatives have attempted to do this, but unfortunately many large purchasers of iron ignore it and have drawn their own. In some cases there are such restrictions that they are practically unworkable or apparently without much regard to the iron available in their locality.

There certainly is a wide variety to choose from in this locality, for we have a number of different kinds which can be roughly classified as follows: Those made from magnetite, those made mainly from lake ores, Virginia irons made from brown ore, Alabama irons made largely from the red ores, various foreign makes, chiefly English and Scotch, and lastly, two brands of local cinder iron. When one considers the possible combinations by which a mixture can be made, it seems to me to be unwise to draw up such specifications for manganese and phosphorus that would exclude many furnaces from bidding when by combining several brands the mixture wanted can be obtained.

I think my point can best be made clear by an illustration taken from actual practice.

One railroad specifies for No. 1 iron: Silicon, 2.75 to 4.50 per cent; phosphorus, 0.40 to 0.70 per cent.

The silicon limits are wide enough. Presumably the iron is intended for light section castings and then the question arises, why so low phosphorus? It so happens that there are a number of furnaces near the lines of this road making a high grade foundry iron usually running 0.70 to 0.90 phosphorus. Why should they be shut out from competing when by mixing with the lower phosphorus lake ore irons which are also available the desired result could be obtained?

Two other railroad companies specify for No. 1 iron, 0.02 per cent sulphur or less. Now can this small amount be determined with such accuracy that the buyer would be justified in rejecting it if it ran slightly higher? The United States bureau of standards prepares standardized samples of iron and in so doing employs the best chemists. One of its pig iron samples shows a range from 0.032 to 0.036 per cent suphur in the results of five chemists. Not a great difference it is true, but suppose there was a like variation on 0.02 sulphur iron. Who could say which result was correct and whether the iron should be rejected or not? The blast furnace specifications for No. 1 iron call for 0.030 per cent sulphur or less in the eastern and 0.05 or less in the other districts. This is a grade that can be easily made enough below the maximum limit to allow for such variations. As a matter of actual foundry practice, how can such small variations be detected in the casting? This iron is melted with coke from which it gains from 0.03 to 0.05 per cent sulphur. An iron containing 0.02 sulphur would then contain from 0.05 to 0.07 in the casting. Under these conditions, a variation of a few thousandths of 1 per cent in the sulphur contents of the pig does not seem to be of much importance.

Another case that came to my notice was a large lot of iron rejected for being 0.001 per cent below the limit in manganese. Now this element cannot be determined with such accuracy. In sample C of the bureau of standards the manganese reported by five chemists range from 0.62 to 0.68. In a standard steel the results by six chemists range from 0.385 to 0.43. If the results of three other chemists who also worked on the samples were included, the variation would be greater. It so happened that the transaction referred to took place on a rising market and the iron rejected had to be removed by the seller when the railroad purchased other iron at an increased price. If the purchaser had bought an additional carload of high manganese iron, the whole matter could have been adjusted without loss or delay. In short, too much fussiness about specifications is often costly to the foundry.

In closing, a word as to the blast furnace specifications. As they now stand, five districts are named southern, eastern, central west and lake points, Chicago and Buffalo. The last three named all use lake ores and it seems to me highly desirable for the sake of simplicity that their silicon and sulphur specifications be made uniform. The differences that now exist are trifling. What seems to me to be needed on the part of consumers is a knowledge of what can reasonably be demanded of the producers and specifications so drawn (more especially for phosphorus and manganese) that as many furnaces as possible can compete.

[1] A paper presented before the Philadelphia Foundrymen's Association, Dec. 2, 1908.
[2] 390 South Tenth Street, Philadelphia.

NEW FOUNDRY OF THE FEATHERSTONE FOUNDRY & MACHINE CO.

The Featherstone Foundry & Machine Co. is now building another large foundry with a capacity of 75 tons a day at Burnside, near Chicago. It is expected that the new plant will be ready for occupancy in 90 days. The location is at the corner of Cottage Grove avenue and Ninety-fifth street, with the Illinois Central railroad on one side and at one end the Chicago, Rock Island & Pacific and the Chicago & Western Indiana. Directly across the Illinois Central tracks are the Burnside shops of the Illinois Central. The new foundry will turn out all kinds of railroad castings and clearly establishes this company as the largest maker of railroad castings in the west.

The general layout as shown in Fig. 1, is unusually advantageous. As indicated the plant will consist of a foundry building 364 feet 6 inches by 133 feet 6 inches over all, and a pattern storage building 75 feet 6 inches by 133 feet 6 inches, 50 feet north of the foundry. The most has been made of the adjacent railroad facilities for receiving and shipping and the plant is traversed by three continuous spurs connecting the railroads as shown in the ground plan.

Added to these facilities for general shipping is the obvious advantage of being within a stone's throw of the large repair shops. On one side of the buildings is a receiving track and on the other a delivery track. The track which runs through the buildings is used for trucking patterns and flasks, thus conveniently serving the interior of the foundry.

The foundry yard on the receiving side of the plant is to be covered by a 15-ton crane which will have a span of 90 feet and will operate over a length of 440 feet, which area of service embraces practically all of the foundry yard on that side. The crane runways will be carried on heavy structural steel columns, the inner row being flush with the building line of the foundry. Beneath this crane the receiving track will run and the crane will be equipped with a lifting magnet and hook so that all material for the charging of the cupolas or

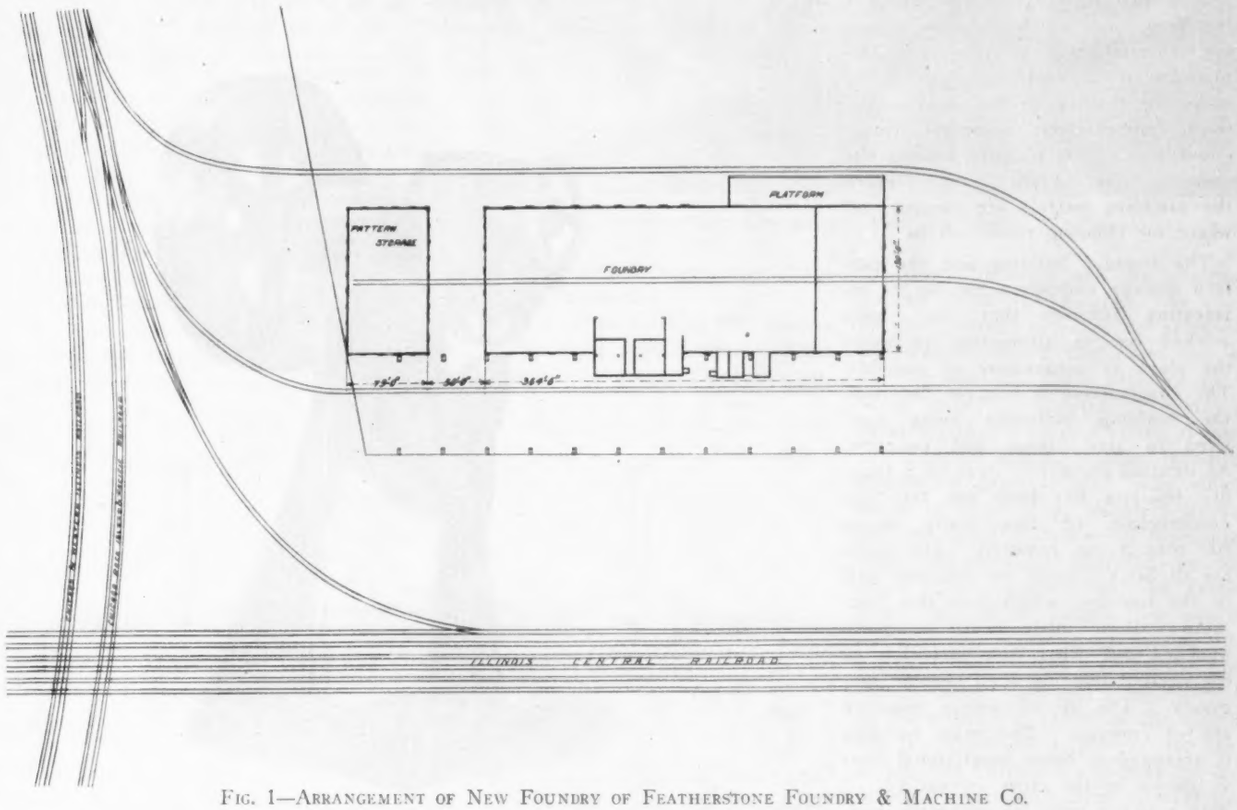


FIG. 1—ARRANGEMENT OF NEW FOUNDRY OF FEATHERSTONE FOUNDRY & MACHINE CO.

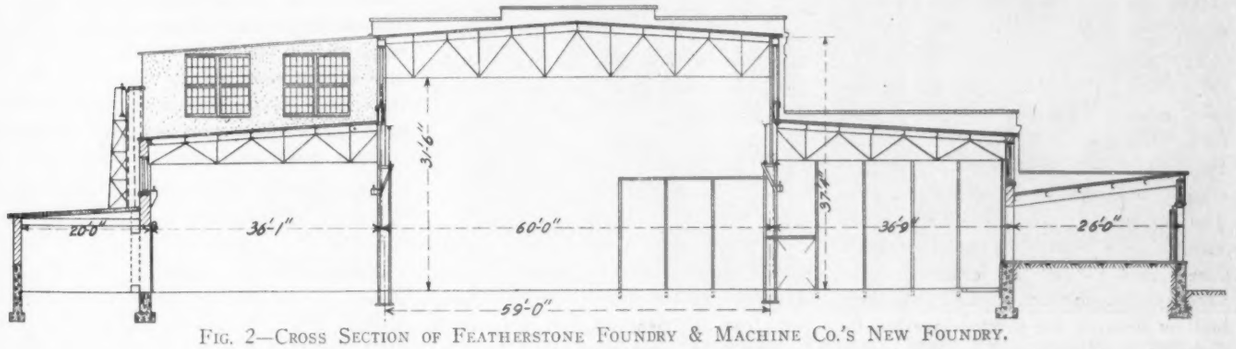


FIG. 2—CROSS SECTION OF FEATHERSTONE FOUNDRY & MACHINE CO.'S NEW FOUNDRY.

other purposes may be handled. As indicated in the plan of the foundry the cupola-charging floor extends out from the building under the crane so that the pig, coke and stone may be lifted by the crane directly onto the charging trucks.

On the delivery side of the foundry the ground plan also shows a covered loading platform 26 feet wide and 144 feet long, from which all of the outgoing material may be handled. The platform is at such a height as to make the loading of the cars on the track immediately alongside, most convenient. This plaform adjoins the cleaning room of the foundry where the tumbling barrels are located and where the chipping room will be.

The foundry building and the pattern storage embody a number of interesting features that have been worked out in attempting to make the plant as progressive as possible. The construction is entirely fireproof, the building materials being confined to steel, brick and concrete. An unusual amount of steel for a foundry building has been put into the construction of this plant, about 800 tons being required. The walls are of brick, except for the end wall of the foundry, which is a thin concrete wall so made as to be easily knocked out when the extension of the present building shall become necessary. The floors where required are of concrete. The main building is arranged in three longitudinal bays as shown in the cross section Fig. 2, with a 10-ton crane spanning the middle bay and a 2-ton crane operating in the side bays. All of the cranes will be Shaw cranes furnished by Manning, Maxwell & Moore. The runway of the 10-ton crane extends through the end of the building and 80 feet beyond out into what will be the flask yard for the foundry. In this manner the flasks may be easily handled in and out. How liberally the lighting problem has been treated is shown by the fact that all of the wall space up to the limit of strength of the walls has been utilized for windows.

The arrangement of the cupolas and the core ovens is such that two cupolas will be installed, centrally located in the side bay. What type of cupola will be installed has not been finally decided. The hot metal ladles will be handled entirely by the overhead cranes. There will be no jib cranes in the foundry. A mezzanine floor has been built in between the ground level and the charging floor above and on this mezzanine floor which has the same floor area within the foundry as the charging floor, are located the blowers and storerooms. In addition to the crane service to the cupola there will be an elevator running up through the mezzanine and charging floors on the inside of the foundry. The mezzanine floor is provided with steel sliding doors opening out into the foundry yard so that it is also accessible to the crane service.

The location of the core ovens, of which there are three, is shown in the ground plan of the building. The core ovens vary in size, being 10 feet 8 inches, 12 feet 8 inches and 14 feet respectively in width, and 20 feet deep. They extend out from the building and are fired from the outside.

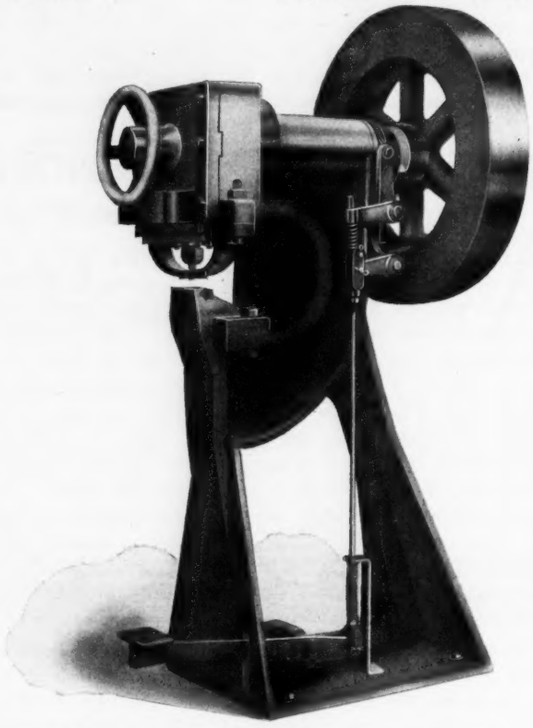
The pattern storage building will be three stories high and will be entirely fireproof. The pattern racks will be made of steel pipe. An elevator will serve the three floors and the trucking track which runs through the foundry will also extend into the pattern storage building. The plant is laid out on a ground plan 500 feet by 800 feet, which will provide for the ultimate extensions contemplated.

The Milwaukee Wire Fence Co., Milwaukee, Wis., has been granted a charter with $50,000 capital stock. James and John P. Meehan and Eugene M. Smith are the incorporators.

A LIGHT RAPID ACTION PUNCH.

The accompanying illustrations show a light rapid-action punch built by the Rock River Machine Co., Janesville, Wis. The main body and base of the machine form a single casting, in which great care has been taken to have the main body sufficiently rigid to absorb all stresses brought about by the shock of punching.

The main bearings are of generous proportion, both in length and diameter. The machine, as illustrated, is provided with an architectural jaw for working structural shapes, light angles, etc. This jaw is a steel casting fitted to the body of the machine in such a manner as to eliminate any vertical or horizontal movement in punching.



"Rock River" Light Rapid Action Punch.

The belt drives directly on the flywheel and an automatic stop stops the punch at the highest point of its stroke for every revolution of the flywheel. The reciprocating ram is actuated by means of the cam spindle, thus obviating all lateral pressure against the sides of the ram box. The face plate is tongued and grooved to give good support to the end bearing of the eccentric shaft.

The machine may be fitted with any shearing attachments for bar or round iron or for angles or splitting. The capacities of the machine are as follows: Punches, 3/8-inch steel plate; shears, 2 x 2 x 1/8-inch angles, 3 x 3/8-inch steel bars; splits, 5/16-inch steel.

AN AIR-CONTROLLED VARIABLE SPEED TRANSMISSION.

A clutch, in which a piston actuated under fluid pressure, and acting against the centrifugal action of revolving weights, controls the contact pressure of the clutch shoes against the drum, has been designed by the Variable Speed Clutch Co., of Milwaukee, Wis. The arrangement of the device and the principles involved may be readily understood from the sectional view, Fig. 2, in conjunction with the other views in Figs. 1 and 3. The drawing shows the device mounted on a jack-shaft in a position for driving any one of a wide variety of belt-driven tools. As the illustration indicates, the clutch is operated by pneumatic or hydraulic pressure, ordinarily the former, the fluid being carried up to the shaft through the piping "K" shown and delivered to the actuating cylinder "H" through a longitudinal center hole in the shaft and the opening "L." At "O" are the stuffing box connections. The pressure is controlled by the valve "M" and the gage "N" and the flow of fluid which starts and stops rotation is controlled by the cock "T."

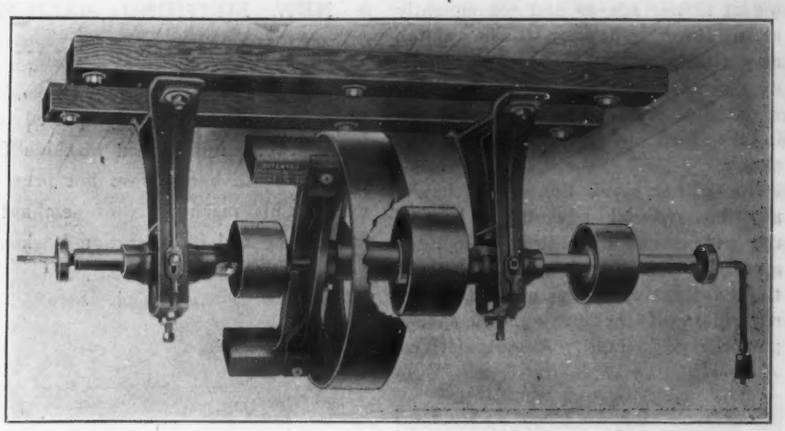


FIG. 1—PNEUMATICALLY-CONTROLLED VARIABLE SPEED COUNTERSHAFT.

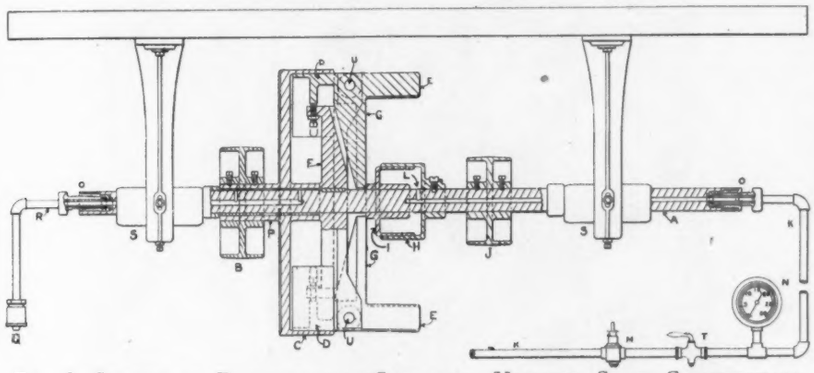


FIG. 2—SECTION OF PNEUMATICALLY-CONTROLLED VARIABLE SPEED COUNTERSHAFT.

The actuating cylinder is fitted with a piston which shoulders against rocker arms "G," pivoted at "U," and cast solid with the clutch shoes "O" on one arm and counterweights "E" on the other. It is apparent that the reciprocation of the piston will be accompanied by throwing the clutch shoes into and out of contact and the opposed outward and inward swinging of the counterweights. The pivoting bolts are mounted in the spider "F" which is keyed to the jack shaft as are the actuating cylinder and the driving pulley "J." The clutch drum "C" is mounted loosely on the jack shaft and is drawn free from the line shaft by means of the pulley "B" which is keyed on a sleeve of the drum casting.

Pressure in the cylinder "H" throws the clutch shoes into contact and the rotation of the drum is communicated to the jack shaft. This rotation, however, acting upon the counterweights tends to throw them outward and thus release the shoes. A balance is thus established between the piston pressure and the centrifugal action of the weights. As soon as the piston pressure is released, the weights throw the shoes out of contact and the drum revolves as a loose pulley. Analytically, there is imparted to the shoes a series of minute impulses which, in effect, produce a uniform pressure and from which there is possible a complete gradation of speed transmission depending upon the pressure indicated by the gage. This pressure may be varied from two to 30 pounds per square inch, so that opening or closing the regulating valve will give to the machine being operated any desired speed within the range of the clutch. In the case of a planer, for example, the cutting speed may be immediately increased from 10 feet per minute to maximum speed without stoppage. The tool may be operated, therefore, at the maximum speed on all parts of the job where otherwise the delays of changing from one speed to another necessitates operat-

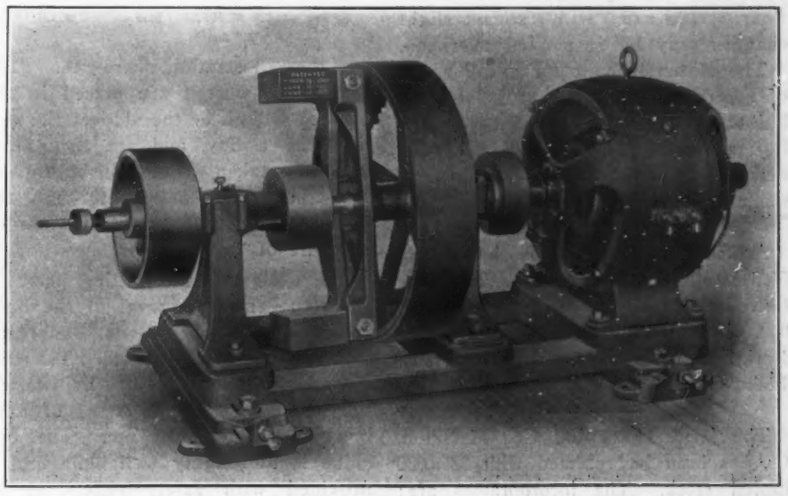


FIG. 3—PNEUMATICALLY-CONTROLLED VARIABLE SPEED COUNTERSHAFT DIRECT-CONNECTED TO MOTOR DRIVE.

ing at slower speeds and consequently at a lower efficiency. The clutch may also be adjusted for work requiring constant speed which can be maintained regardless of variations in the load up to capacity of the clutch.

For planer work this clutch naturally has special advantages beyond the wide range of cutting speed. It gives a constant return speed to the table as high as the planer will stand, regardless of the cutting. A special planer type is built. A motor-driven,

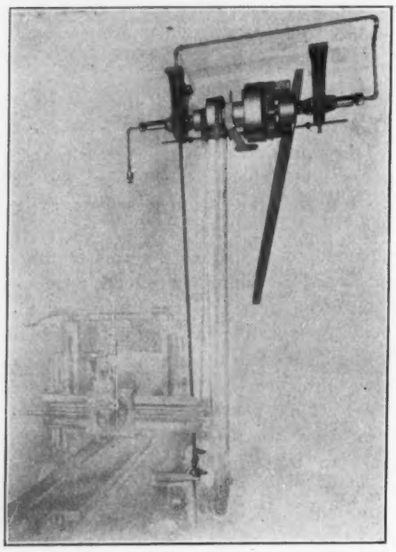


FIG. 4—PNEUMATICALLY-CONTROLLED VARIABLE SPEED COUNTERSHAFT APPLIED TO PLANER.

direct-connected type of clutch, Fig. 3, is also built. The motor and the clutch are mounted on the one base and connected by a flexible coupling. This may be operated either as a floor stand or with some slight changes may be suspended overhead.

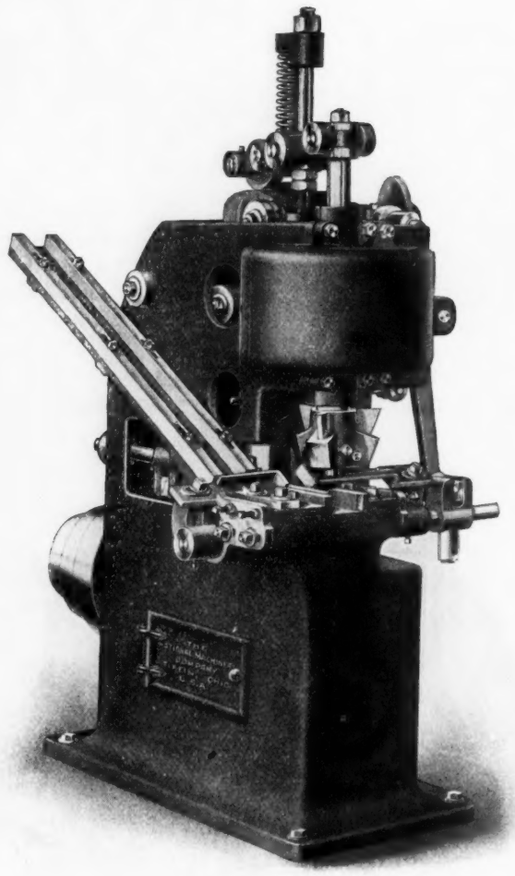
The clutch is built for a full range of speeds and powers and is applicable to all machine tools, woodworking machines and almost all belt-driven machinery in many lines of manufacture.

Articles of incorporation have been filed by the Cantleak Metal Valve Co., Cleveland, which has a capital of $10,000. The incorporators are: W. B. Burke, L. H. Heister, E. J. Anderson, Blake C. Cook and W. C. Barnum.

The Jewel Motor Car Co., Massillon, O., has been incorporated with $250,000 capital stock. The incorporators are: H. A. Croxton, O. P. Beinhard and F. T. Taggart.

A NEW FINISHING MACHINE FOR HOT PRESSED NUTS.

The National Machinery Co., of Tiffin, O., have recently placed on the market an improved machine for removing the burrs from hot pressed nuts. This machine is of semi-automatic type and its operation is shown by the illustration herewith. The nuts to be burred are placed in the inclined trough at the side of the machine by a boy, and are then automatically taken from the bottom of the trough and passed through the machine without further attention on the part of the operator.



MACHINE FOR REMOVING BURRS FROM HOT PRESSED NUTS.

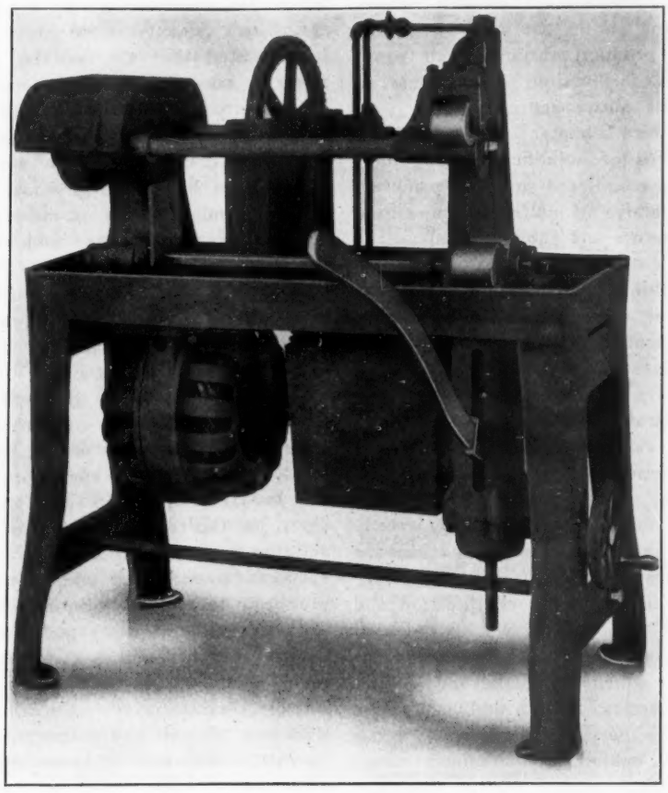
The design of the cutting head insures the entire removal of the burr, and, on account of its simplicity, is easily set and adjusted. The cutting head automatically adjusts itself for different thicknesses of nuts, trips on blank nuts, etc. The machine is thoroughly well built, and is provided with safety reliefs at all points.

The machine is a high duty tool, and has a capacity from two to four times as great as hand machines. It also gives a much more uniform quality of output; and, as the operator does not work in close proximity to the cutters, the hazard of accident is eliminated. The machine illustrated above handles square and hexagon hot-pressed nuts of all sizes from 5/8-inch to 1¼-inch bolt size. It is easily changed from one size to another.

Pittsburg Foundrymen.—The regular monthly meeting of the Pittsburg Foundrymen's Association was held in the auditorium of the Carnegie Technical Schools, Monday evening, Jan. 4. Eugene Smith, of Crane Co., Chicago, presented a paper on "Malleable Iron Castings." B. M. Stewart, Pittsburg manager of The Ferrofix Brazing Co., Philadelphia, also read a paper on "Autogenous Welding." In connection, Mr. Stewart gave a demonstration in the foundry department of the technical schools of the process of welding and cutting metals by the use of oxygen and acetylene gas.

A MOTOR-DRIVEN PIPE OR TUBE CUTTER.

Machines for cutting off pipe or boiler flues are often placed in a pipe shed or any location where power from a line shaft is not available so that a motor drive becomes especially advantageous. In this connection the motor-driven pipe cutting machine shown herewith will prove of special interest. The machine is a No. 6 Fox pipe or tube cutter equipped with a three horsepower Westinghouse alternating-current motor, for a 440-volt, 60-cycle, three-phase circuit.



MOTOR-DRIVEN TUBE CUTTER.

It will be noticed that the machine with motor drive is compact in arrangement, and the motor is mounted with practically no change from the standard machine except that the bed is provided with two pads for bolting the motor on and in place of the regular tight and loose pulley is placed a large sprocket for the Morse silent chain drive. The machine will cut off 4-inch boiler flue in about eight seconds.

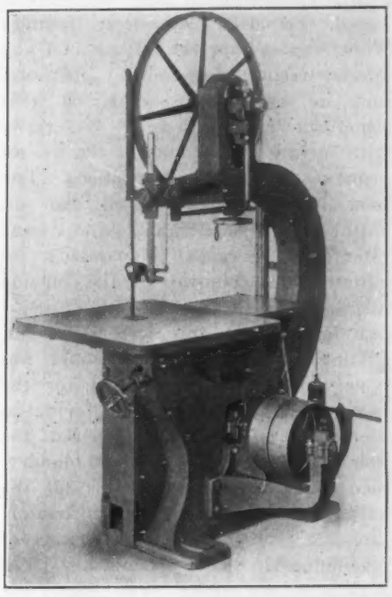
Power for the motor is transmitted through the Morse silent chain and a series of gears to the cutter shaft. The flue to be cut rests on the two rollers under the cutting disc and the hand wheel shown below adjusts the position of the rollers for different size pipe or flues. The cut is accomplished by depressing the lever which raises the rollers, bringing the flue against the cutter disc and severing it in a very short space of time. In fact, 1½-inch standard wrought iron pipe can be cut in about three seconds in this manner.

The machine is regularly equipped with an oil pump and tank for supplying the lubricant to the cutting side. These machines are manufactured by the Fox Machine Co., Grand Rapids, Mich.

A Handsome Album.—The Chicago Railway Equipment Co., Chicago, has issued a handsome souvenir album illustrating features of its manufacturing plants. The album comprises about 150 9½ x 7½-inch pages devoted entirely to half tone illustrations of various departments of its several works, each illustration being covered by an onion skin paper bearing the trade mark of the company. The book is unique in that it contains no reading matter whatever, but nevertheless it sets forth the magnitude of the company and its operations in a most striking manner.

A NEW PATTERNMAKERS' BAND SAW.

The accompanying illustrations show features of a new 36-inch patternmakers' band saw recently placed on the market by the American Wood Working Machinery Co., Rochester, N. Y. The feature of this machine is the tilting table, which is of iron, strongly ribbed and supported on double segments that rest on a machined seat and which are rigidly gibbed to the base. In size, it is 36 x 36 inches, and it has a positive tilting adjustment consisting of screw and swivel nuts. The table tilts both ways, 6 degrees to the left and 45 degrees to the right. The auxiliary table is of wood, 17 x 18 inches, and is securely bolted to the main bed. The upper wheel is made light, with a cast iron spoke center and a hardwood rim of 2-inch face. The lower wheel is of cast iron and of the balance-wheel type. It is totally enclosed with a casing having two doors, which open in the center and swing either way, giving ample room to remove the blades. Deflecting plates are provided inside of the casing, whereby the dust is collected and thrown to the front of the machine. The capacity of the machine is a height of cut under the guide of 16 inches and the swing is 36 inches between the saw and column. The maximum width of saw blade is two inches, and its length is 19 feet 4 inches. The machine is made in two styles, with and without doors, weighing 2,300 and 2,000 pounds, respectively. The floor space occupied is



AMERICAN WOOD WORKING MACHINERY CO'S PATTERNMAKER'S BAND SAW.

4 feet 2 inches by 5 feet 3 inches and the machine stands 8 feet 3 inches high. It is driven by a four-horse-power motor.

MR. PILKINGTON AND AMERICAN FOUNDRYMEN.—A REPLY TO AMERICAN CRITICISM.

Herbert Pilkington, the president of the Sheffield (England) branch of the British Foundrymen's Association, availed himself of the opportunity furnished by a meeting of the branch on Dec. 12, to reply to some comments made in THE IRON TRADE REVIEW of Nov. 19, upon his presidential address to his branch.

Mr. Pilkington, it may be remembered, criticised American foundry work, saying that he did not feel any special respect for foundry methods, and he especially complained that American castings were universally soft, mainly on account of the use of hematites of various descriptions. THE IRON TRADE REVIEW replied that the softness of American castings was intentional, because this quality facilitated the removal of the outside metal.

Referring to this criticism, Mr. Pilkington said that he should not have noticed the matter but for the fact that the American criticism seemed rather to have missed the point of his remarks. British foundrymen made their castings to suit the purpose for which they were ultimately intended, and not to secure ease of machining by the producers. The American magnetite ores would be classed in Great Britain as hematite, and the Americans had none of the ores of the character of Northampton, Lancashire, and Cleveland, which are oolitic and lias ores, and they appeared to have abandoned in America the use of clay-bands, which made the selection of foundry irons for various purposes wider and which gave a greater range in respect of quality, hardness, etc. In Great Britain much less notice was taken of ease of machining of castings, than of endurance and suitability for the purpose for which they were required.

William Nees was named receiver on Dec. 28 by a federal judge, for the Elbe Iron Co., Beverly, N. Y. The corporation was placed in bankruptcy the week before.

An increase of 46,436 in idle cars has been reported in the past two weeks, making the total number now idle 222,077.

BOOK REVIEWS.

Alloys (Non-Ferrous). By A. Humboldt Sexton. Manchester, England. Scientific Publishing Co., 5 ¾ x 8 ¾ inches. 283 pages. Illustrated. Cloth. $2.00, postage and duty extra.

In his introduction the author points out the four lines along which research work has been conducted in the systematic study of alloys as chemical analysis, microscopic examination, fusion and solidification, and the examination of the physical properties. The second chapter defines alloys and shows the relation of the finished products through their properties to the various constituents of which the alloys are composed.

The third chapter deals with the phenomena of solidification, the difficulties encountered in the manufacture of alloys of uniform composition and structure and shows the advantage of slow cooling and of keeping the upper portion of the metal liquid to the last, over other methods devised for the prevention of the blow-holes, or unsoundness in alloys.

Chapters IV and V give the method of preparation of microscopic slides, and the value of microscopic study in the detection of the physical structure and the various changes that arise through cooling and annealing.

The author next deals with the properties of metals used in the manufacture of alloys; the composition and uses of the brasses whose essential constituents are copper and zinc; the bronzes which comprize the copper and tin series; the tin and lead series known as the white alloys; the various forms of babbitt; the aluminum alloys of practical value where lightness, strength and non-corrosiveness are essential; and the alloys of the rare and precious metals.

The fifteenth chapter is especially valuable as it deals with the different methods utilized in the manufacture of alloys. Here the author quotes freely from other authorities.

It may be regretted by some readers of the book that the iron series, which is the most important of them all, is purposely omitted from the text but this is pardonable because an entire volume would be required to do them justice.

The author not only gives in concise form to the world our working knowledge of these commercial products but points out clearly the lines along which further research work is needed. The book upon the whole is most admirable and will be welcomed by all students of this technical industry and all manufacturers and users of alloys.

Morrison's Spring Tables and Handbook for Engineers, Students and Draftsmen. By Egbert R. Morrison, Jun. Am. Soc. M. E. Sharon, Pa. Morrison & Martin. 84 pages, 6 x 9 inches. Cloth. Supplied by THE IRON TRADE REVIEW for $2.

The purpose of this little book is to facilitate calculations in designing helical and elliptical steel springs. It begins with seven pages of formulae, for all questions that may enter into the calculations, such as length and diameter of bar, diameter of coil, weight of spring and capacity at various heights. It is stated that the working static stress is taken at 80,000, the modulus of elasticity at 25,400,000 and the modulus of torsional elasticity at 12,600,000. The method of deriving the formulae is not given, but this is no doubt available in standard works on machine design. The rest of the book is entirely devoted to spring tables. Values of length, weight and free height per inch of solid height and of capacity are given for every diameter of helical bar from 1/16 inch up to 1½ inches, varying by sixteenths, and for all these diameters of bar for various outside diameters of coil, varying by 1/16 inch for all sizes for which the bar is adapted. Tables are also given for the rectangular and elliptical sections and for elliptical plate springs, covering the whole range of practical dimensions. Such questions as what is the capacity and what the length, weight and free height per inch of solid height of a spring whose outside diameter is 1 inch, inside diameter ½ inch and diameter of bar ¼ inch, are answered immediately by reference to these tables without calculations of any kind.

The book will no doubt be found of great value by all designers who have occasion frequently to make designs of springs.

The Fall River Foundry & Machine Co., Fall River, Mass., general foundry and machine building, has been incorporated with $10,000 capital stock. The officers are: President, Thomas H. McNerney; Thomas T. Daley, treasurer, and James P. McNerney, clerk, all of Fall River.

Salesmen of the Johns-Manville Co., of Cleveland, held their annual convention last week. In conjunction with the convention an exhibit was held in one of the rooms belonging to the firm.

Expected January "Break" Arrived.

While the turn of the year had been awaited in some stock markets as more or less certain to bring on a "bull" market in January, yet precedent had been against such a price movement in the opening month of each new year in almost a decade. The market followed precedent last week. True, Monday's break was ascribed to an adverse decision of the United States supreme court in a price controversy with a New York City gas company. But older heads declare that it was bound to come in any event, the decline being not only logical, but healthy.

Monday's declines were a surprise to some, however, and were fairly general throughout the list. Further declines followed Tuesday's opening, which was also weak. Weakness developed further Wednesday, but later in the day recovery was noted and the close was steady. Advances were scored Thursday, the bond market being especially active and several new issues being announced. Irregularity distinguished Friday's market and Saturday's close was depressed, largely because of $2,000,000 gold being exported to the Bank of France.

Money was extremely easy in general throughout the week, a large inflow of currency from interior banks being ascribed as the cause. While call money was loaned Monday at 3 per cent, yet later the rate fell to 1½ per cent, the week's average being 2¼. A good sized business was done in time money. The week's total bank exchanges in the United States established a record for three years, the largest for the corresponding week in the country's history. They showed a gain not only of 54 per cent over the like week last year, but also 8 per cent over the week two years ago, and 5 per cent three years ago.

While the gain in surplus reserve reported by clearing house banks Saturday was less than $2,000,000, yet the gain in specie and legal tenders was more than $19,500,000. The actual statement of the banks showed loans increased $14,157,000; deposits increased $32,050,900; and the percentage of actual reserve 27.08, an increase of 0.83. Non-member banks and trust companies reported loans decreased $4,958,000; net deposits increased $16,911,500; and the percentage of reserve 28.7, an increase of 1.4. Commercial failures for the week were 329, compared with 299 the previous week and 435 in the corresponding week last year. Shares to the number of 5,985,742 were sold, compared with 3,556,765 the preceding week and 3,888,740 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $36,554,000, compared with $36,215,000 the preceding week and $21,154,000 the corresponding week last year.

Copper Stocks.

New York.—Amalgamated Copper closed 81⅞, a net loss of 2¼.

Boston.—Butte Coalition closed 25¾, a net loss of 1¼; Calumet & Arizona closed 117, a net loss of 1¼; Calumet & Hecla closed 665, a net loss of 10; North Butte closed 82⅜, a net loss of 1¼; Quincy Mining closed 95, a net loss of 1.

Financial Notes.

The American Rolling Mill Co. declared the regular quarterly dividend of 1½ per cent on preferred stock, payable Jan. 15; National Carbon Co., the regular quarterly dividend of 1 per cent on common, payable Jan. 16; Champion Machinery Co., Joliet, Ill., semi-annual dividend of 3½ per cent, payable Jan. 15; American Screw Co., the regular quarterly dividend of 1½ per cent, payable Dec. 31; the Minneapolis General Electric Co., the regular semi-annual dividend of 2 per cent on common and 3 per cent on preferred, payable Feb. 1.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. Jan. 9	Changes in Week	Date 1908 Ann. M't'g	Stock Outstanding	Dividend Basis	Dividend Last Declared	Dividend Date Last Div. Pay.
Allis-Chalmers	15	− ¾	Sept. 3	19,820,000			
Allis-Chalmers pr	48	−1⅛		16,150,000	7 cum	1¾ Q.	Feb., 1904
American Can	9	....	Feb. 3	41,283,300			
Am. Can pr	72¾	− ⅜		41,233,300	7 cum	1¾ Q.	Jan., 1909
Am. Car & Foundry	49	−1⅛	June 25	30,000,000		½ Q.	Jan., 1909
Am. Car & Fdy. pr.	109¾	+ ⅜		30,000,000	7 n. c.	1¾ Q.	Jan., 1909
American Loc.	56¾	−1⅛	Oct. 20	25,000,000	5	1¼ Q.	Aug., 1908
American Loc. pr.	111	−2		25,000,000	7 cum	1¾ Q.	Jan., 1909
American Ship	58¾	+1¾	Oct. 14	7,600,000	4	1 Q.	June, 1908
American Ship pr.	105⅛	....		7,900,000	7 n. c.	1¾ Q.	Oct., 1908
Am. Steel Foundries(new	38¾	−1⅛	Oct. 6	15,810,000			
Am. Steel Foundries. pr.	47⅝	....		14,247,400	6 cum	2½	Aug., 1904
Barney & Smith	40	....	June 2	2,000,000	4	1 Q.	Sept., 1907
Barney & Smith pr.	110	....		2,500,000	8 cum	2 Q.	June, 1908
Bethlehem Steel	24¾	+ ¼	April 7	14,862,000			
Bethlehem Steel pr.	52	−2⅞		14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	38⅛	−1⅜	March 17	45,000,000*	6	1½ S. A.	Aug., 1908
Cambria Iron	46	− ⅛		8,468,000*	4	2 S. A.	Sept., 1908
Chicago Pneumatic Tool.	27½	....	Feb. 17	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	41½	+1½	Oct. 19	34,235,500		3½	April, 1902
Crucible Steel	8⅞	+ ⅛	Oct. 21	24,578,400			
Crucible Steel pr.	58	+½		24,436,500	7 cum	1 Q.	Dec., 1907
Empire Steel	6	....	Feb. 26	1,264,770			
Empire Steel pr.	47	....		2,500,000	6 cum	3 S. A.	July, 1908
Fay & Egan	90	....	Feb. 18	1,000,000	6	1½ Q.	Nov., 1908
Fay & Egan pr.	100	....		1,000,000	7 cum	1¾ Q.	Nov., 1908
General Electric	156½	−1½	May 12	65,167,000	8	2 Q.	Oct., 1908
Harbison-Walker	18	+ ⅜	Jan. 20	18,000,000		½	Oct., 1907
Harbison-Walker pr.	81	+1		9,600,000	6 cum	1½ Q.	Oct. 1908
International Pump	39⅛	....	June 2	17,787,300		1	April, 1905
International Pump pr.	84¼	+ ⅛		13,835,000	6 cum	1½ Q.	Nov., 1908
Lackawanna Steel	47	....	March 11	34,971,400			
Lake Sup. Corp.	15¼	− ¾	Oct. 7	40,000,000			
New York Air Brake	90	−3	June 18	8,012,500	8	2 Q.	Oct., 1907
Niles-Bement-Pond	97	....	Feb. 5	8,500,000	6	1½ Q.	Dec., 1908
Niles-Bement-Pond pr.	100	....		2,000,000	6 cum	1½ Q.	Nov., 1908
Otis Elevator Co.	43	+1	March 16	6,156,600		1½ S. A.	April, 1908
Otis Elevator Co. pr.	93	−4		5,449,500	6 n. c.	1½ Q.	Jan., 1909
Penn. Steel	50	....	May 11	10,750,000			
Penn. Steel pr.	104	+ ½		16,500,000	7 n. c.	3½ S. A.	Nov., 1908
Pittsburg Coal Co.	13	−1	Feb. 10	28,853,400			Nov., 1906
Pittsburg Coal Co. pr.	49	....		27,030,800	7 c.	1¾	April, 1908
Pressed Steel Car	42	−1⅝	Feb. 19	12,500,000		3	Aug., 1904
Pressed Steel Car pr.	102	....		12,500,000	7 n. c.	1¾ Q.	Nov., 1908
Pullman	170	−1	Nov. 11	100,000,000	8	2 Q.	Nov., 1908
Railway Stl. Spring	47½	− ¼	March 5	13,500,000	4	2 S. A.	Oct., 1908
Railway Stl. Spring pr.	102½	....		13,500,000	7 cum	1¾ Q.	Sept., 1908
Rep. Iron & Steel	25½	− ½	Oct. 21	27,191,000			
Rep. Iron & Steel pr.	86¾	+ ¾		20,416,900	7 cum	1¾ Q.	April, 1908
Sloss-Sheffield	78½	+1	March 11	10,000,000	5	1 Q.	Dec., 1908
Sloss-Sheffield pr.	110	....		6,700,000	7 n. c.	1¾ Q.	Jan., 1909
U. S. Pip & Fdy.	30	+ ¾	June 24	12,500,000	4	1 Q.	Dec., 1907
U. S. Pipe & Fdy pr.	77	+1¾		12,500,000	7 n. c.	1¾ Q.	Sept., 1908
U. S. Steel	52¾	−1¾	April 20	508,302,500	2 n. c.	¼ Q.	Dec., 1908
U. S. Steel pr.	122¾	− ½		360,281,100	7 cum	1¾ Q.	Nov., 1908
U. S. Steel 5;	102⅝	− ⅜		463,798,000	5	5 A.	
Va. Iron, Coal& Cke.	64	+1¾	Nov. 17	9,078,680			
Westinghouse Elec	85	+ ¾	June 24	23,933,200	10	2½ Q.	Oct., 1907
Westinghouse Air Brake	111	+ ¼	Oct. 6	14,000,000*		2½ Q.	Jan., 1909

Par value of shares, $100, except those starred (*), $50

NEWS FROM MANY INDUSTRIES

New Buyers:—

O. E. Krueger, M. H. Joy, M. Slater, C. F. Clapp and R. A. Slater have incorporated the Superior Iron & Steel Co., Warren, O., with $200,000.

The American Scale & Gas Engine Co. of St. Louis, Mo., with $10,000 capital stock, has these incorporators: Charles F. Mauch, E. G. Burklin and J. M. Bergfield.

The Autogenous Welding Device Co., Kansas City, Mo., with $5,000 capital stock, has been chartered by William J. Stowe, Frank C. Harvey, Benton C. Moss and others.

Articles of incorporation have been granted to the Monarch Metal Mfg. Co., Kansas City, Mo., capitalized at $50,000. E. F. Mulligan, Edward C. Wright, Vernon Ross and others are the incorporators.

A charter has been granted to the Oklahoma Stove & Structural Iron Co., Oklahoma City, Okla., with $75,000 capital stock. The incorporators are William M. Mathias, William F. Busg, Davis L. Meyers and Charles N. Adkins.

Articles of incorporation have been filed by the Superior Bronze Co., Wilmington, Del., with $10,000 capital stock. The incorporators are: George Turner, Marshall A. Roddy, George W. Dorsey Jr., all of Wilmington, Del.

C. M. German, C. E. German, Josephine German, Charles Long and H. E. Engelhart, Cincinnati, O., are the incorporators of the Steam Appliance & Supply Co., Cincinnati, which has been incorporated with $15,000 capital stock.

The Vasil Co., Boston, general machinery, with $10,000 capital stock, has been incorporated through these officers: President, Vasil McKay, 3 Appleton street; treasurer and clerk, Joshua Crane, 50 Congress street, both of Boston.

A charter has been granted to the Henderson Co., Monadnock block, Chicago, to manufacture and install steam specialties, with $8,000 capital stock. The incorporators are: Albert J. Appell, Charles Schoenlaub and Walter Brown.

The Robinson Furnace Co., 134 Monroe street, Chicago, has asked for a charter to manufacture heaters. The company is capitalized at $20,000, and has these incorporators: Edward H. Robinson, Frank E. Robinson and J. E. Pierson.

The Genessee Pump Co., Rochester, N. Y., has been chartered with $100,000 capital to manufacture pumps. Those interested are: John O. Roe, William H. Williams, George H. Smith, Rochester; Thomas T. Graser and Charles H. Rowland, Brighton, N. Y.

The Clothmeter Mfg. Co., St. Louis, Mo., which has been chartered with $75,000 capital stock to manufacture and deal in automatic machinery, has these incorporators: Otto A. Heckel, Ernst H. Spellmeyer Jr., Henry E. Pauk, William F. Goessling and F. Rudolph Meyer.

The Dunham Peck Mfg. Co., Gloversville, N. Y., has been incorporated to manufacture machinery and farming implements. The capital stock is $5,000, and the incorporators are: William J. Dunham and Eugene W. Peck, Gloversville, and Frank J. Robinson, Northville, N. Y.

The Quaker City Pneumatic Tool Co., Philadelphia, has been incorporated with $15,000 capital stock, by Ralph M. Seaman, 1535 Foulkrod street, Philadelphia. The directors are: Frederick S. Graham, Charles A. Struntz, Ralph M. Seaman, and A. Mark Bradner, all of Philadelphia.

A certificate of incorporation has been granted to the Hopcroft Producers Gas Co., Rochester, N. Y., to manufacture gas producers, gas engines, etc., with $24,000 capital stock. Ernest D. Hopcroft, Charles A. Bruff and Wilfred B. Tuxhill, Rochester, N. Y., are the incorporators.

The McPherson Willard Forge & Machine Co., Camden, N. J., mechanical and electrical engineer, tool maker, machinist and founder, has applied for a charter, with $75,000 capital stock. Dwight L. Willard, Phillip L. Swank and Theodore F. Carter, Camden, N. J., are the incorporators.

Articles of incorporation have been filed by the Peerless Whittler Co., Fulton, N. Y., to manufacture machinery and tools. The capital stock is $125,000, and the stockholders are: Charles J. Kleber, 244 West 106th street; Stephen S. Newton, 199 Washington street, and Julius H. Kaesen, 918 Eighth avenue, all of New York.

A charter has been granted to the Columbian Iron Works, Chattanooga, Tenn., which will manufacture machinery, engage in the business of steam-fitting and piping, construct water, gas, sewer and drainage works, deal in all kinds of tools, machinery, etc., and build furnaces and heating plants, etc. The incorporators are: H. M. Loftin, George M. Guild, C. D. Richmond, Charles A. Lyerly, Theodore Richmond and W. E. Miller, all of Chattanooga, Tenn. The capital stock of the new company has been placed at $125,000.

The Goldschmidt Detinning Co., Jersey City, N. J., to detin scrap, tin plate and tin cans, with $3,000,000 capital stock, has filed application for a charter through Hubert E. Rogers, 1 West Seventy-second street; Franz H. Hitschland, 60 Wall street, both of New York City, and John J. Treacy, 15 Exchange place, Jersey City.

The Meeker Grip Nut Co., New York City, has been incorporated by the following: Samuel G. Meeker, Fairmount Park, Rochester, N. Y.; Walter Schulze, Belle Harbor, Rockaway Park, L. I., and E. W. Cushing, 660 East Second street, Flatbush, L. I. The company is capitalized at $10,000, and has incorporated to manufacture mechanical contrivances.

The William H. Wood Loco Fire Box & Tube Plate Co., Camden, N. J., has been incorporated to manufacture fire boxes and tube plates, and to do business as a mechanical and electrical engineer with $500,000 capital stock. The incorporators are John Creth Marsh, 1218 Stephen Girard building, Philadelphia; Frank B. Rhodes and William E. T. Kolp, Media, Pa.

The William Jessop & Sons Steel Sales Co. has been incorporated at St. Louis, Mo., to manufacture and deal in tools and machinery, especially products manufactured by William Jessop & Sons, Ltd., of Sheffield, England. The capital stock, fully paid, is $20,000. Those interested are: Ezra H. Lindley, David G. Evans, Joseph C. Branch, Robert C. Bremer, John H. Heimbuecher, Arthur E. Kamerer and G. William Senn.

New Construction:—

Mitchell & Van Meter, Pottstown, Pa., are having plans prepared for a brass foundry, 40 x 75 feet.

The Chickasaw Iron Works, Memphis, Tenn., has completed installing an additional five-ton cupola at its North plant.

Although but recently having opened its new foundry, the Oklahoma Iron Works, Tulsa, Okla., is planning to enlarge further because of the growing

volume of business. When the proposed additions have been made the force of workmen will be nearly doubled. The company confines its work almost exclusively to oil field work.

Plans are being prepared by the Ohio Malleable Iron Co., Columbus, O., for improvements to its plant estimated to cost $50,000.

The Milwaukee Bridge Co. is planning to erect an addition estimated to cost $30,000, to the plant at Thirty-fourth street and Concordia avenue, Milwaukee.

The Shull Steel Castings & Mfg. Co., Canton, O., high grade open-hearth steel castings, is building an addition to its plant at Canton, to be used as a pattern storage house.

Excavation has been commenced for the refractory brick plant of the Harbison-Walker Refractories Co., at Wylam, Ala. A large force of workmen has been employed and 40 teams are at work.

Plans have been prepared for McCord Co., Detroit, for a one-story brick foundry, 58 x 114 feet, at Orleans street and Grand boulevard.

W. F. McAndrews has taken out a building permit in Chicago to construct a one-story brick foundry at 896-902 Carroll avenue, estimated to cost $5,000.

Plans have been completed for a hospital to be built by the Indiana Steel Co., at Gary, Ind., five stories, 50 x 160 feet, fireproof, pressed brick and stone construction, at an estimated cost of $150,000.

The Chesapeake Iron Works, Bush street and B. & O. railroad, Baltimore, has plans for the erection of a new girder shop, 60 x 120 feet, of steel construction. An electric traveling crane and other machinery will be installed for handling material.

The Crane Co., manufacturer of valves, fittings and wrought pipe, is having plans prepared for a foundry with eight cupolas. The Crane Co. has also awarded the contract for the construction of a warehouse of reinforced concrete at Memphis, Tenn., three stories, 87 x 100 feet, to cost $80,000.

The Maysville Foundry & Engineering Co., Maysville, Ky., successors to the Maysville Foundry, Machine & Marine Co., advises that it is adding a 40-foot extension to its main foundry building and is also erecting a side bay to the foundry, 55 x 110 feet, which will add in all 8,000 square feet to its molding space. The new machinery installation will include one 42-inch cupola, blower, air compressor, pneumatic chippers, improved rattlers and grinders, all to be driven by individual motors. The company's output consists almost entirely of machine tool castings which with the new addition will amount to about 45,000 pounds a day.

The Vulcan Iron Works, Denver, Colo., has under construction for the use of the Vulcan Sheet Metal Co., a brick and steel shop, 52 x 150 feet wide, with an annex 18 x 40 feet. The building will cost about $14,000 and will be located on trackage property at West Colfax avenue and Osage street.

The Talladega Foundry & Machine Co., Talladega, Ala., received proposals Jan. 5 for machinery with which to establish a machine shop and foundry for job work estimated to cost $3,000. The officers of the company are: President, E. W. McDonald; vice president, C. L. Kelly; treasurer, J. M. Thomas; and secretary, C. F. Baker.

The Crescent Emery-Corundum Wheel Co., Indianapolis, advises that it is the successor to the Rupert Co. which has been manufacturing the Crescent corundum wheel for the last year and a half. The officers of the new company are: President, R. O. Rupert; vice president and treasurer, Chester G. Browne; secretary and general superintendent, R. O. Rupert Jr., and the entire capital stock is fully paid. The new company proposes to enlarge the plant greatly and to add new machinery, including a 60,000-pound hydraulic press, one 20-inch and one 30-inch swing lathe, one heavy speeding machine, grinders and some special machines.

Growing business of the Richmond Pattern & Structural Iron Works, Richmond, Va., has compelled the company to lease the old Triggs works blacksmith shop, for whose equipment new machinery has been ordered to be installed by Jan. 15. The plant now occupied will be retained and will be devoted to the manufacture of ornamental work.

General Industrial:—

The Rockford Bit Co., Kokomo, Ind., has been authorized to operate in Illinois with $2,000 capital.

The Vulcan Foundry Co., Hamilton, O., has changed its name to the Andrews-Stevenson Co.

The Burt Mfg. Co., Akron, O., recently received from the government an order for two large exhaust heads for installation in power houses in the Panama canal zone as well as filters for several other power-houses in the zone. The third order from Canton, China, for a total of 34 ventilators has been entered as well as orders for ventilators from Kobe, Japan.

Strong, Carlisle & Hammond Co. has taken out incorporation papers to do business in Michigan with headquarters in Detroit, the capital stock in Michigan being placed at $2,000.

A. M. Lockett & Co., New Boston, Ill., a Louisiana corporation, has taken out an Illinois charter with $100,000 capital to install power and pumping plants.

W. B. Parry, a wholesale hardware dealer of Utica, N. Y., has purchased an old foundry building at 314 Catherine street, Utica, and plans to repair it for the purpose of continuing the gray iron foundry business.

Adam's Steel & Wire Co., Joliet, Ill., has received a contract for supplying steel for 176 cells for the New York state reformatory at Elmira. This is one of the largest contracts received by the Joliet company in months.

At the recent annual meeting of the Modern Iron Works, Quincy, Ill., George Fischer and Nicholas King, whose terms as directors had expired, were re-elected. The election of officers will be held shortly.

The machinery has been started in the new addition to the plant of the Union Foundry Co., Anniston, Ala. A total of 350 men is employed at this plant, making it one of the largest soil pipe foundries in the country.

L. S. Colyar, of Chattanooga, Tenn., who with others purchased recently the properties of the Phoenix Iron & Coal Co., advises that no definite plans have as yet been formulated for developing the properties.

The International Harester Co., Chicago, has acquired a tract of 40 acres at Neuss, Germany, near Dusseldorf, where it will erect a manufactory for agricultural implements. It proposes to begin operating in the fall of 1909 with 600 workmen, this force to be increased later.

The Empire Foundry Co., Grant D. Green and Thomas Van Ornam, Syracuse, N. Y., recently incorporated, advises that the incorporation includes the company which has been in existence for three years. At present neither building extensions nor machinery installation is contemplated.

Henry L. Doherty, purchaser of the plant of the Southwestern Bridge Co., Joplin, Mo., some days ago, for $82,300 at public auction, has an-

nounced that he will operate the plant until it can be definitely determined wheher it can be profitably operated in Joplin. H. W. Klare, formerly general manager of the Southwestern Co., has been retained in this position by Mr. Doherty.

The Acme Machinery Co. reports that business is gradually increasing. Two-thirds of the working force is working full time each day, while one-third is working only eight hours.

The Interstate Brick Co., Lowellville, O., which has been incorporated by interests affiliated with the Ohio Iron & Steel Co., will manufacture high grade brick and paving block from shale deposits and will erect a plant for their manufacture at the Carbon Limestone Co.'s quarries, Hillsville, Pa.

The Raber & Lang Mfg. Co., Kendallville, Ind., whose main product is concrete mixing machinery, advises that while just recently incorporated it has been in existence since 1906 as a partnership. No further building will be done at this time as the company has its own furnished foundry and machine shop.

A deal has been completed whereby the Johnson Co., Lorain, O., takes over the plant of the Brown-Cochran Co., of that city. The plan offered by the Johnson Co. was this; it will surrender all its claims against the Brown-Cochran Co., it will pay in full all claims which are legally guaranteed; it will within 10 days pay 25 per cent of the unsecured claims to the creditors' committee, or as soon thereafter as the claims may be determined.

The Lawson Mfg. Co., 623 Ellicott square, Buffalo, recently incorporated, advises that it is manufacturing a loose pulley oil cup and has several other articles which it proposes to manufacture but their nature it is not yet ready to announce. No decision has yet been made as to the erection of a factory building.

An order has been issued by the federal court at Toledo authorizing the sale of the Toledo Pope factory to the Toledo Motor Co. The sale will be confirmed Jan. 11 if the transfer is not opposed. Albert G. Pope is president of the Toledo Motor Co., which was recently organized with a capital of $10,000. The Toledo company is to assume all the debts of the Pope Motor Car Co. and settle with creditors as speedily as possible.

The Bartz, Wygant & Brown Co., Inc., Hornell, N. Y., which makes the Royal electric specialties comprising electric coffee mills and electric meat cutters, that are sold by the A. J. Deer Co., Buffalo, nothing but the Hornell company's product, has formed an organization under the name of The A. J. Deer Co., Inc., which will take effect as soon as the new office building, which is in process of construction, is completed, probably about April 1. This office building is three stories and basement, 36 feet by 72 feet and will be up-to-date in every particular. The Hornell company has ordered the extra machinery, etc., that will be needed for the present.

The Elizabeth City Iron Works & Supply Co., Elizabeth City, N. C., has been incorporated with $100,000 capital stock by J. F., Brad, Andrew and H. W. Sanders, to take over the Elizabeth City Iron Works and the Elizabeth City Supply Co., of 305-317 Pearl street, and the machine shop and foundry at 405-407 Pearl street. It will do a general brass, iron and boiler repair work.

The Taunton Rivet Works, Taunton, Mass., has been taken over by a new company under the same name, recently incorporated. The directors of the company are: William J. Davison, of Taunton, who has also been selected as treasurer, W. C. Biddle and P. J. Kaylor of New York City, and W. H. Nelson of Taunton. The new owners have placed the works on full time, making iron and copper rivets.

The W. Eddy Plow Co., Greenwich, N. Y., which was recently incorporated with a capital stock of $100,000 under the name that it had borne as a partnership concern for years, has these officers and directors. President and manager, O. H. Eddy; vice president, J. W. Wallace; treasurer, W. T. Liddell; secretary, I. V. H. Gill; assistant manager, T. A. Eddy; H. C. Gray, C. C. Van Kirk, I. C. Blandy. LeRoy Thompson, F. W. Eddy and J. R. Skinner. The company advises that the purpose of incorporation is to increase the capacity of the plant and extend its trade. The force of workmen at the plant has been increased, additional salesmen are to be put on the road and the output doubled at once. The business was originally established in 1832 by Walden Eddy, who was actively interested in the work for over half a century.

The New Process Steel Co., Marshall, Mich., has re-organized, and has these new officers: President, S. C. French; vice president, L. A. Stuart; secretary and treasurer, H. L. Chapman. The directors include the already named officers and in addition, A. B. Van Esschen, C. J. Cronin, F. J. Burton and W. T. Phelps. The company is building a two-story office building 25 feet square, and an addition to its foundry 25 x 110 feet, and it is also installing machinery to add to its present equipment for doing machine work of all kinds. The company is building engines for the George L. Sintz Co., and expects to make a specialty of furnishing vanadium steel crank shafts and connecting rods in the rough as well as finished. All this proposed equipment has been purchased, and the company expects to increase the output of its present plant at least 100 per cent within the next 90 days.

Trade Notes:—

The Carpenter Steel Co., Reading, Pa., announces the appointment of John B. Guthrie as its Pittsburg representative with offices in the Columbia Bank building.

Announcement is made that the firm of Stanley G. Flagg & Co, Philadelphia, was dissolved Dec. 31 by limitation. The business will be continued under the same firm name by Stanley G. Flagg Jr., who takes over the business as of that date.

The American Steam Gage & Valve Mfg. Co. announces from Boston that after Jan. 1 John B. Guthrie will be its sole representative in the Pittsburg disrict, with offices in the Columbia Bank building, corner of Fourth avenue and Wood street, Pittsburg.

The Hartford Steam Boiler Inspection & Insurance Co. has opened a department office on the sixth floor of the Empire building, Atlanta, Ga., which will be in charge of W. M. Francis as department manager. The new department will include the states of North and South Carolina, Georgia and Florida.

Fires:—

The malleable iron foundry of the American Car & Foundry Co., at Berwick, N. J., was badly damaged Dec. 24, the loss being estimated at $50,000.

The plant of the Lambert & Todd Machine Co., Camden, N. J., was damaged Dec. 24, with a probable loss of $5,000.

The plants of the Heller Tool Co. and the Heller Bros. Steel Works, Newark, N. J., were damaged Dec. 25. The damage was confined to three storage buildings and the grinding plant, the loss being placed at $2,500.

TENNESSEE COAL, IRON & RAILROAD COMPANY

PIG IRON
FOUNDRY—FORGE—BASIC
"DeBardeleben," "Eureka," "South Pittsburg," "Ensley," "Alice."

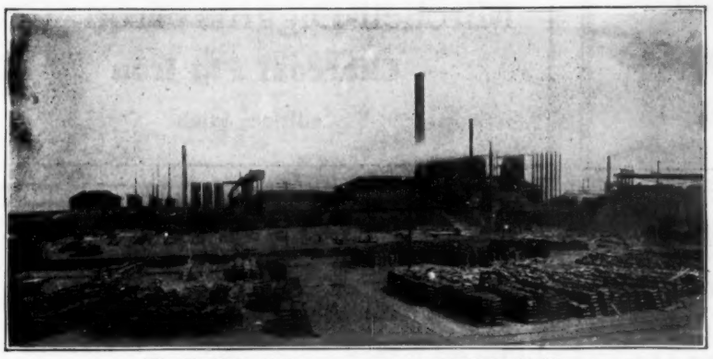
OPEN HEARTH STEEL
Rails, Blooms, Billets, Slabs, Bars
Sheared Plates, Angles

COAL
Steam—Gas—Blacksmith
Domestic

COKE
Furnace—Foundry
Domestic

GENERAL OFFICES:
Woodward Building, Birmingham, Alabama

DISTRICT SALES OFFICES:
New York, Philadelphia, Chicago, San Francisco, St. Paul, St. Louis, Boston, Denver, Cincinnati, Buffalo, New Orleans, Pittsburg, Detroit, Cleveland, Portland



The Buffalo-Union Furnace Co., Buffalo, N. Y.

At Buffalo

We make a high grade Foundry and Malleable Iron.

Inquiries Solicited.

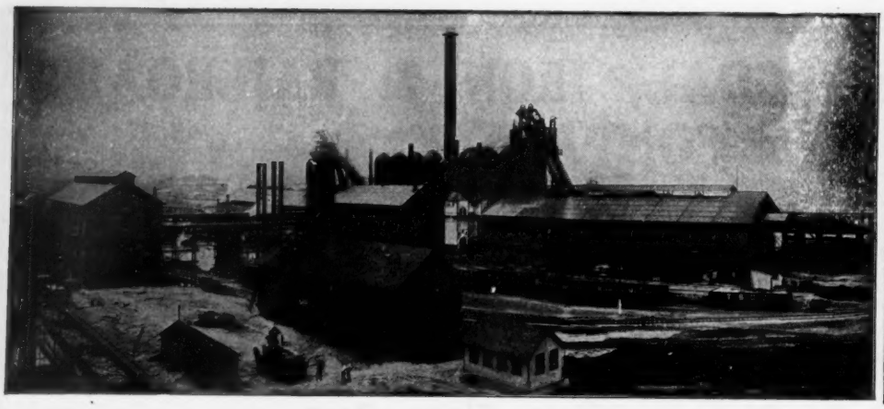
M. A. HANNA & CO.
CLEVELAND

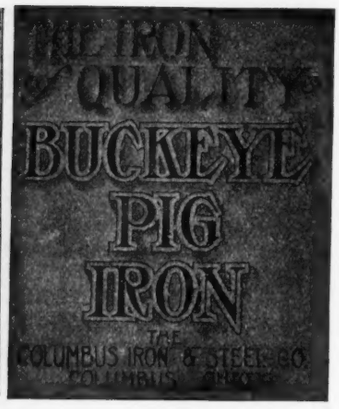
W. P. SNYDER & COMPANY

Pittsburg, Pa.

PIG IRON, COKE, ORE

Products of
THE SHENANGO FURNACE COMPANY





Time Tried Endurance

Under all conditions prove the fitness and reliability of our

Clinton & Hector

Inspected Foundry Iron soft, strong and uniform—now and always

CLINTON IRON & STEEL CO.

Gen'l Offices and Furnaces PITTSBURG, PA. New York Office 24 Broad St.

The THOMAS FURNACE CO.

Milwaukee, Wis.

Makers of FOUNDRY PIG IRON

DE CAMP BROS. & YULE

IRON, COAL AND COKE CO.

St. Louis - - Chicago

PIG IRON COKE SMITHING COAL FERRO-MANGANESE, ETC.

Exclusive Agents for Leading Brands IRON

EATON, RHODES & CO.

Pig Iron--Coke

First National Building,

CINCINNATI, O.

Mitchell-Diggins Iron Co.

Charcoal Pig Iron

Cadillac, Mich.

Robesonia Low Phosphorus Pig Iron

J. TATNALL LEA & CO., *Sole Agents,*

STEPHEN GIRARD BUILDING

19 South 12th St. Philadelphia

THE "CLEARFIELD" FIRE BRICK

MANUFACTURED BY

THE CLEARFIELD FIRE BRICK CO.

Office and Works at - - CLEARFIELD, PA.

FAIRVIEW FLUOR SPAR & LEAD CO.

Mines: Fairview Landing, Illinois. Sales Office: 38 Park Row, New York City.

It is no longer necessary to use inferior Fluor-Spar. Having now an annual capacity of 50,000 tons we are prepared to furnish promptly

GRAVEL—For Steel Mills, running 90% and up C-F and not over 4% Silica.
LUMP—For Foundry use, running 94% and up C-F and less than 3% Silica.
GROUND—For Manufacturers of Hydro Fluoric Acid—Glass and Enamel Ware manufacturers, running 99% and up C-F and not over 0.50% Silica.

Prices are right. Let us send our Sales Manager to you. We want your contract.

Address: JOHN MULHOLLAND, President, 38 Park Row, New York City

BICKFORD FIRE BRICK COMPANY
CRESCENT FIRE BRICK

We manufacture exclusively hand made, high grade fire brick for

Blast Furnaces and Hot Blast Stoves, Open Hearth, Heating and Puddling Furnaces, Malleable Iron Plants, Glass Works, Cupolas, Rotary Cement Kilns and all high grade uses.

1122 FARMERS BANK BUILDING, PITTSBURG, PA.

Telephones: Bell, Grant 3144. P. & A., Main 194.

WORKS AT CURWENSVILLE, CLEARFIELD CO., PA.

(Formerly controlled by Reese-Hammond Fire Brick Co.)

THE STOWE-FULLER COMPANY, Cleveland, O.

FIRE BRICK
"Quality, Not Quantity."

We manufacture at our own Plants the highest quality of Magnesite, Chrome, Silica, and Fire Clay Brick with personal attention of interested and expert managers. Our brands are the Highest Quality made and we would be pleased to prove this to you in actual work, as we have with others.

Six Modern Plants, - - - - - - - 200,000 Daily Capacity.

Located in Pennsylvania, Ohio, and Kentucky. The only company furnishing all grades of furnace material from their own plants.

The highest grade refractories of all kinds.

Blast Furnace Lining that stands the wear with Skip Hoists or Hand-Filled Furnaces.

Pittsburg Office 711 House Bldg.

Ashland Fire Brick Co.

Ashland, Ky.

FIRE BRICK

For all purposes

Five Large Plants

Established 1864

CAPITAL STOCK

$100,000.00

HIGH GRADE FIRE BRICK

THE SCIOTO FIRE BRICK COMPANY

Sciotoville, - Ohio

AMERICAN REFRACTORIES COMPANY

Commercial National Bank Building, CHICAGO, ILL.

Silica, Magnesia, Chrome and Fire Clay Brick
Magnesite, Chrome Ore and Fire Clay.

Sole Agents
AUSTRO-AMERICAN MAGNESITE CO., of Austria.

General Western Agents
ASHLAND FIRE BRICK COMPANY

THE NILES FIRE BRICK CO.

ESTABLISHED 1872.

Manufacturers of High Grade

FIRE BRICK

Band Niles No. 1

Blast Furnace Linings, Rolling Mill Heating Furnaces and Malleable Furnaces a specialty

Office and Works: Niles, Ohio

DOVER FIREBRICK CO.

MANUFACTURERS OF

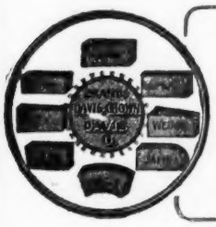
Highest Grade Pennsylvania and Ohio

FIRE BRICK

"NORTH BEND" "DOVER" "BUCKEYE"

General Office 509 Cuyahoga Bldg., Cleveland, Ohio.

Pittsburgh Office 610 Fitzsimons Bldg., 331 Fourth Ave. Telephone No. 2191 Court



THE OHIO FIRE BRICK CO.

OAK HILL, OHIO

FIRE BRICK

JOS. SOISSON FIRE BRICK CO.

Manufacturers of High Grade Fire and Silica Brick for all purposes. Coke Oven Brick a specialty.

Main Office, Connellsville, Pa.

Stock List No. 908 Just Published!

CONTAINS

SIMPLE CORLISS ENGINES from 50 to 1,200 horse power.
COMPOUND CORLISS ENGINES from 200 to 2,000 horse power.
SIMPLE AUTOMATIC ENGINES from 25 to 600 horse power.
COMPOUND AUTOMATIC ENGINES from 100 to 1,000 horse power.
THROTTLING ENGINES, all sizes.
BUTT-STRAPPED TUBULAR BOILERS, 100 to 150 horse power.
LAP SEAM TUBULAR BOILERS, all sizes.
FIRE-BOX and MARINE BOILERS up to 250 horse power.
WATER TUBE BOILERS; Babcock & Wilcox, Heine, Cahall, etc.
TANKS, open and pressure up to 65,000 gallon capacity.
ENGINE WHEELS for belt, rope driving or plain balance.
FEED WATER HEATERS, open and closed, up to 3,500 horse power.
PUMPS, up to 12-million gallon capacity.
AIR COMPRESSORS, steam and belt driven.

Electric Equipment

DIRECT CONNECTED RAILWAY UNITS 500 Kw, 300 Kw and 225 Kw.
DIRECT CONNECTED ALTERNATORS, 25 and 60 cycle up to 600 Kw.
BELTED RAILWAY MACHINES up to 500 Kw.
DIRECT CONNECTED 250 and 125 volt units, direct current.
BELTED UNITS, 250 and 125 volts, direct current.

Ask for Special List Large Pumps

from one million to 12 million capacity, suitable for waterworks, steel plants, furnaces: Worthington, Barr, Wilson-Snyder, Laidlaw-Dunn-Gordon and other first-class makers.

Immediate delivery; low prices.

The Norton Machinery Company

828 W. 6th St., CINCINNATI, O.

NOTICE

Machinery Dealers—Concerns Supplying Building Contractors.

Kindly write us for our Agency Plan to handle and represent our lines of Concrete Mixers and Cement Brick Machines.

SOUTH BEND MACHINE MFG. CO.
108 LaSalle St,, CHICAGO. U. S. A. P

FOR SALE

A Waterbury-Farrel No. 2½ heading and one No. 2½ reheading machine; never used; brand new; warranted; bargain.

OHLEN COMPANY
Box 740, Columbus, Ohio p

SECOND-HAND "HIGH GRADE" MACHINERY

BORING MACHINES

(1) 2B Binsse Horizontal
(1) "F" Baker Special
(1) 3 in. Bar Lucas—42 in. table
(2) 30 in. Bullard
(1) 37 in. Bridgeport—(1) head
(1) 84 in. Betts. 2 heads
(1) 10 ft. Pond floor boring machine

DRILL PRESSES

(8) Barnes Friction
(4) 1-spindle sensitive
(3) 2-spindle sensitive
(1) 4-spindle Reed sensitive
(1) 6-spindle Quint turret
(1) 20 in. Barnes upright
(1) 24 in. Pratt & Whitney
(2) 24 in. Baker high speed
(4) 25 in. W. F. & J. Barnes
(2) 26 in. Lodge & Davis
(1) 30 in. Prentice Bros. (new)
(1) 33 in. Bement-Miles
(1) 34 in. Barnes—gear feed
(1) 24 in. Fosdick Radial

GEAR CUTTERS

(1) Grant-Lees hobbing machine
(1) 30 in. x 8 in. Brainard spur
(1) 36 in. x 9 in. x5p Gould & Eberhardt
(2) 50 in. x11 in. x5p Gould & Eberhardt

GRINDERS

(2) Cincinnati Cutter & Tool
(1) Pratt & Whitney cutter and surface
(1) No. 2 Brown & Sharpe Universal

LATHES

(1) 10 in. x 4 ft. Davis [ment.
(1) 14 in. 6 ft. Prentice, taper attach-
(1) 14 in. x 6 ft. Flather comp. rest
(1) 14 ft. x 6 ft. Hendey, taper attachment
(1) 14 in. x 6 ft. Flather, taper attachmen
(1) 14 in. x 6 ft. Whitcomb Blaisdell turret on shears
(2) 14 in. x 6 ft. Le Blond
(1) 14 in. x 8 ft. Flather
(2) 15 in. x 6 ft. Blaisdell
(1) 16 in. x 6 ft. Reed
(2) 16 in. x 6 ft. Lodge & Shipley
(2) 16 in. x 6 ft. Pratt & Whitney
(1) 20 in. x 8 ft. Flather
(1) 22 in. x 12 ft. Walcott, comp. rest
(1) 24 in. x 8 ft. Flather
(1) 24 in. x 10 ft. Lodge & Barker
(1) 26 in. x 12 ft. Reed—chuck fitted
(1) 52 in. x 20 ft. Jackson & Wiley
(1) 62 in. x 20 ft. Cummer
(1) 62 in. x 25 ft. Putnam, motor driven

LATHES—POLISHING

(2) No. 3 Diamond, 62 x 1 1-4 spindle
(3) No. 7G Diamond, 48 x 1 1 4 spindle

MILLING MACHINES

(1) No. 2 Pratt & Whitney—hand
(1) No. 3 Garvin—hand
(1) No. 1 Pratt & Whitney—plain
(1) No. 1 Brainard Universal
(1) No. 15 Becker-Brainard Univ.
(1) No. 2 Brown & Sharpe universal
(1) No. 3 Brown & Sharpe universal
(6) No. 2 Pratt & Whitney Lincoln pattern
(1) No. 40 Becker-Brainard double head
(1) 42 in. x 24 in. x 8 ft. Ingersoll, slab

PLANERS

(1) 20 in. x 20 in. x 4 ft. Wheeler, 1 head
(1) 24 in. x 24 in. x 6 ft. Cincinnati 1 head
(1) 26 in. x 26 in. x 10 ft. Powell, 2 heads
(1) 36 in. x 36 in. x 10 ft. Gray, 1 head, arranged for 2.
(1) 42 in. x 36 in. x 14 ft. Cincinnati, 2 heads
(1) 42 in. x 42 in. x 21 ft. Woodward & Powell, 4 heads

PRESSES

(1) D75 Ferracute
(1) No. 62 Toledo
(1) No. 8 Greenerd arbor

SAWS

(1) 6 in. Cochrane-Bly
(1) 6 in. Newton

SHAPERS

(1) 15 in. Pratt & Whitney tool room
(1) 16 in. Stockbridge, back geared
(1) 20 in. Hendey
(1) 24 in. Gould & Eberhardt
(1) 24 in. Hendey
(1) 24 in. Potter & Johnson
(1) 28 in. Hendey

TURRET LATHES

(2) No. 2 Pratt & Whitney wire feed
(2) No. 3 Pratt & Whitney wire feed
(1) No. 4 Bardons & Oliver
(1) No. 5 Warner & Swasey
(2) 2 in. x 24 in. Jones & Lamson
(1) 2 in. x 26 in. Pratt & Whitney
(1) 21 in. Gisholt with taper att.
(1) 22 in. Bullard "H" machine
(2) 22 in. Lodge & Shipley

THE MOTCH & MERRYWEATHER MACHINERY CO.

707-715 Lakeside Ave. N. W., Cleveland, Ohio

Detroit Br'ch: 1025 Majestic Bldg. Cincinnati Br'ch: 1014 1st N't'l B'k Bldg

SHEARS

22" foot power shear.
20" Lambertville, double end punch and shear.
36" Harrold punch or shear, NEW.
No. 7 Hilles & Jones vertical punch and shear, 16" knife, 18" throat.
Hand power lever shear.
Newbold rotary shear, 53" throat.
Belt driven upright shear, 4½" throat.
Plate beveling shear, 6½" knife.

MISCELLANEOUS

for Steel Works and Rolling Mills

1 stand 3-high 18' closed top housings.
1 stand 2-high 22" bar mill housings.
9' Fry-Scheker dry grinding pan.
5' Wilkes dry pan.
9' 2" x 21½" x 24½" cast iron bosh.
10' x 18" x 30" steel plate bosh.
Corrugating machine for sheets.
Newbold rotary drum squeezer.
United Engineering No. 0 angle straightening machine, engine driven.
Fly wheels and pulleys, all sizes and weights.

Wickes Brothers

117-119 Fourth Ave.

PITTSBURG, - PA.

Frogs & Switches

ALSO

LIGHT RAILS, SPLICE BARS, SPIKES & BOLTS, SWITCHSTANDS, RAIL BRACES,

Quick Shipments of Short Orders.

CAR PUSHERS, DERAILERS, HEAVY CHAIN, PLATES 12" to 36" CUT TO SKETCH.

CENTRAL TRACK SUPPLY COMPANY, Springfield, O.

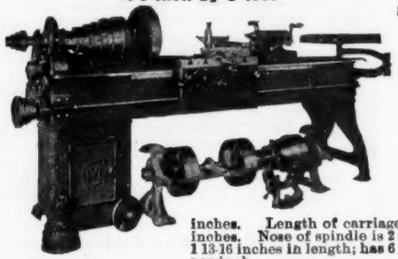
FOR SALE

1—48" x 21' Putnam Triple Geared Engine Lathe, Used six months.
1—12" Niles Late Improved Slotter, used three months.
1—42" x 42" x 8' Detrick & Harvey Open Side Planer. Used three months.
1—14" x 14" Hall Duplex Belt Driven Compressor, 650 cu. ft. Good condition.
1—10 x 10 x 10 Laidlaw-Dunn-Gordon Compressor. Used six months.
1—40" Betts Vertical Boring Mill. Fine condition.

WM. WARD MACHINERY CO., 601 House Building Pittsburg, Pa.

"G.M." SOREW CUTTING ENGINE LATHE

16 Inch by 8 feet



DIMENSIONS

Swings over shears 16 1-4 inches. Swings over carriage 10 1-4 inches. Takes between centers 4 feet 10 1-2 inches. Diameter of hole through spindle 1 5-16 inches. Size of front bearing of spindle 2 9-16 inches diameter by 4 1-2 inches long. Size of rear bearing of spindle 2 3-16 inches diameter by 3 inches long. Traverse of compound rest 4 3-4 inches. Length of carriage bearing on shears 23 inches. Nose of spindle is 2 1-4 inches in diameter, 1 13-16 inches in length; has 6 U. S. Standard threads per inch.

Lathe complete with Large and Small Face Plates, Compound Rest, Steady Rest, Power Cross Feed Change Gears. Splined Screw with interlocking device for belt or gear drive. Wrenches, Large Cabinet Leg and Friction Countershaft. Weight 1,750 lbs.

Manufactured by

The G. M. Lathe Company, Lennox Bldg. CLEVELAND, O.

The Lodge & Shipley Machine Tool Co.

Offer at a Bargain the Following Tools, Most of which are Now in Use in Their Own Shops:

LATHES

1 24" x 10' L. & S.
1 24" x 12' L. & S.
1 30" x 10' L. & S.
1 No. 1 high speed lathe, 16' bed. L. & S.
1 No. 3 rapid reduction, L. & S.

TURRET CHUCKING LATHES

1 24" x 8' L. & S.
1 24" x 7' L. & S.
1 30" x 8' L. & S.

DRILLS

1 Andrews Multiple Spindle Drill, eleven spindles.

GEAR CUTTERS

1 No. 4 Automatic Spur Gear, Brown & Sharpe.

PLANERS

1 36" x 36" x 16' Sellers Planer.
1 36" x 36" x 18' Sellers Planer.
1 36" x 36" x 24' three head, Sellers.
1 36" x 36" x 24' four head, Sellers.
1 36" x 36" x 24' double head, Pond.

Cincinnati, Ohio.

P.

CLASSIFIED ADVERTISING SERVICE

Advertisements for "Positions Wanted" and "Positions Vacant" inserted at the rate of 50 cents for 50 words or less, additional words 2 cents each. All other advertisements under classified headings 15 cents a line for each insertion.

POSITIONS VACANT.

SALESMAN WANTED. AN EXPERIenced salesman, familiar with pipe, fittings and valves and steam fitters' line in general, can find permanent employment by addressing Box 391, THE IRON TRADE REVIEW, Cleveland, O. We want a man to travel in Ohio, Indiana and Michigan and we want results.

REPRESENTATIVES WANTED TO HANdle small steel castings in the following cities: Toledo, Detroit, Erie, Buffalo, Youngstown, Columbus and Cincinnati. Address West Steel & Iron Casting Co., Cleveland, O.

POSITIONS WANTED.

ABOUT TO TERMINATE A FIVE-YEAR contract—a foundryman looks up to see who's next. An advance here if I stay and an outside offer or two, but tonnage and variety and progress in methods is my aim. Since 1883 with blast furnaces, cupolas and laboratories. Original applications of chemistry and metallography. Yet young at 47. Investigate my patents and processes. Mine and city wheels beat all records. High priced mixtures eliminated years ago by study and practice. Address Box 51, care PENTON'S LIST, Cleveland, O. p.

POSITION WANTED AS COST ACcountaint. Young man, 32, married, 10 years office and machine shop experience, thorough accountant and practical machinist, desires position as cost and factory accountant. At present employed as such, but for good reasons wishes to change. No "expert," but a well qualified specialist, seeking a permanent position at a reasonable salary with a responsible machinery manufacturing concern. Address Box 395, THE IRON TRADE REVIEW, Cleveland, O.

SALESMAN, PRACTICAL MAN OF 30, having held the following positions within the past 12 years, with large concerns in the steel, malleable and gray foundry business, is open for an engagement as sales manager, purchasing agent, cost clerk, paymaster, foundry order clerk and salesman, having traveled the past five years from Maine to Kansas City. Address Box 52, PENTON'S LIST, Cleveland, Ohio. p.

POSITION WANTED AS SUPERINTENDent or general foreman, by a thorough foundryman having had long experience on stove plate, gas ranges, heaters, and light work of all kinds, including brass and aluminum castings, considered good in rigging up. Expert on molding machines and match plate equipment. Perfect in cupola practice, can improve conditions and produce results. At present employed in one of the largest and best equipped stove foundries in the country. Solicits correspondence from large concerns contemplating a change in the management of their foundries. High grade reference furnished. Address Molding Machine Expert, care THE IRON TRADE REVIEW, Cleveland, O.

SITUATION WANTED BY THOROUGHly experienced accountant possessing executive ability as accountant, auditor, or office manager, with a thoroughly practical knowledge of factory cost accounting. Now closing eight years' service as accountant and office manager for structural steel company; 15 years' experience, age 34, best of references. Address Box 390, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED AS FOUNDRY foreman; 20 years' experience, 3 as foreman; can handle light or heavy work; understand the mixture of iron and brass; can furnish references. Box 50, PENTON'S LIST, Cleveland, O. p

POSITION WANTED. CHEMIST, UNIversity graduate in chemical engineering course with six years' experience in charge of testing laboratories wants position as chemist or assistant superintendent of blast furnace or smelting works, or steel works. Best of references as to ability and character. Address Box 382, THE IRON TRADE REVIEW, Cleveland, O.

PRACTICAL COST MAN WANTS TO LOcate with manufacturer who wants accurate cost data with minimum help. Can install complete system. Will adjust overhead expense in modern manner; can get results immediately; gives data to manager that will greatly aid production, or corral leaks; system to suit your factory. Address Box 396, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED. MAN WITH COLlege education and six years' experience covering every branch of steel casting business, particularly in practical end in executive capacity, is open to connect himself with steel foundry, and if satisfactory, of becoming financially interested. Address Box 397, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED BY CHEMIST. Seven years' experience in mixing and melting of gray iron, malleable iron, brass, etc. Desirous of making change after the first of the year. Blast furnace, smelter, or manufacturing plant considered. Recommendation from present employer. Careful analyst. Resourceful. Address "Practical," care PENTON'S LIST, Cleveland, O. p.

POSITION WANTED BY AN ASSIStant foundry foreman, energetic and ambitious, having practical knowledge of foundry work, cupola practice, mixing metals and molding machines, capable of advancement. Address Box 54, PENTON'S LIST, Cleveland, O. p.

BUSINESS OPPORTUNITIES

CAPITAL OR A GOING BUSINESS wanted to exploit patented improvements on closed hub, self-oiling, mining wheel of most noted record; the joint owners, a mechanical draftsman and an experienced foundryman, with chemical methods, wish to be identified with the manufacture and their interest to be stock and royalty. Address J. H. R., 2008 Forest avenue, Knoxville, Tenn. p.

STRICTLY MODERN GRAY IRON FOUNdry for sale, completely equipped and in daily operation on profitable machinery work. Located in Michigan town with excellent shipping facilities. Best of reasons for selling and will make liberal terms. Full information cheerfully furnished. Address Box 338, THE IRON TRADE REVIEW, Cleveland, O.

FOR SALE, MACHINE AND MOLDING shops, together with patent coal mine car wheel, wheel fully demonstrated; shops running full time and the only coal mine car wheel factory in Kentucky. I am prepared to give for cash the best trade you ever made. Signature explains reason for selling. Address J. S. Smith, M. D., McHenry, Ky. p.

FOR SALE, FOUNDRY COMPLETE, ALL on the ground ready to set up; everything good and to be in connection with a good new machine shop at Lewiston, Idaho. Write or call on M. D. Taylor for full particulars, owner of machine shop at Lewiston, Idaho. p.

WANTED PARTY WITH A FEW THOUsand dollars to join me in exploring iron property on Mesabi iron range. R. B. Higbee, Germania Life Bldg., St. Paul, Minn.

ENGINE FOR SALE.

FOR SALE—ONE 23 X 60 SINGLE CYLinder, double acting, Harris Corliss, pendulum ball governor, with section cast iron fly wheel, 18 ft. x 38". Good order, requirements changed, electric power being used. Address Almond Mfg. Co., Ashburnham, Mass. p.

ONE HAMILTON CORLISS ENGINE for sale, 125 H. P., good condition. Address Western Iron & Foundry Co., Wichita, Kansas.

UNUSUAL BARGAINS IN GAS ENgines. Ten 2 to 3 H. P. Standard make. Absolutely new engines fully guaranteed—special reason for selling. Address Box 55, PENTON'S LIST, Cleveland, O. p.

FURNACE FOR SALE.

THREE BLAST FURNACES FOR SALE, one in operation, two more which are in good condition and could be put in operation in 60 to 90 days. Parties wishing to investigate these properties would do well to act promptly in the matter. These properties all have very large supply of good 50 per cent iron ore, that is easily smelted and can be mined cheaply. For particulars address Box 388, THE IRON TRADE REVIEW, Cleveland, O.

ONE NO. 2 SCHWARTZ OIL FURNACE for sale, complete with pipe connections, smoke stack, ventilating hood and two extra sets of new linings. Can be bought at a decided bargain if taken at once. Louisiana Contracting Co., St. Louis, Mo.

WASHERS "SPECIAL SIZES."

In any quantity, metal or fibre. Dies, Stamping and Screw Machine Work. Quadriga Mfg. Co., 18 So. Canal St., Chicago, Ill. p.

FOR SALE—MISCELLANEOUS.

PATENT FOR SALE (RECENT ISSUE) pertaining to machine shop equipment, just coming into general use. Good seller, good profits; reason for selling, have other patent better adapted to our equipment and selling to different class of trade. Patterns and jigs go with patent. Address Titus Machine Works, Marion, O. p.

FOR SALE, 90 H. P. ATLAS BOILER; 60 inches diameter; 60 tubes, 3½ inches; length, 14 ft.; shell 5/16 thick; dome 30 x 30, with cast fronts and grate. Good for 75 lbs. pressure. First-class condition. $250.00. Also 200 H. P. Frick upright engine, 18 x 18 cylinder, 180 R. P. M., no flywheel. The Kansas City Bolt & Nut Co., Kansas City, Mo. p.

A POSTAL CARD WILL BRING YOU our list of second-hand and rebuilt woodworking machinery, engines, boilers, etc. All rebuilding and overhauling done in our own shops, guaranteed as represented at prices especially attractive to close buyers. Your inquiries will be appreciated and receive prompt attention. Currier-Koeth Mfg. Co., Coudersport, Pa. p.

FOR SALE CHEAP. LATHE-BED PIPE machine, brand new. The Loew Mfg. Co., Cleveland, O.

FOR SALE. THREE TWO-SPINDLE 1-inch Landis bolt cutters, complete with countershafts, dies, pumps, etc. All in first-class condition. Price low. Graham Nut Co., Pittsburg, Pa.

"TEDDY," THE FAMOUS SCREW FEED flue expander and flue cutter, is the best on earth. Highly recommended and pleasing to all who have tried same. Manufactured by the Fernyak Machine Co., Mansfield, O. Write for full particulars and prices. p.

FOR SALE.—A. B. C. EXHAUST FAN, 35", new, never used. The Bashlin Company, Warren, Pa. p

SCRAP WANTED.

TAKE NOTICE. WE ARE ALWAYS IN the market and pay highest prices for all kinds of Scrap Metals, such as Copper, Brass, Zinc drosses, Skimmings, Brass filings, etc. Our terms are Net Cash. Drop a line and we will be pleased to name best prices. F. O. B., your city. H. Kander & Co., Bowling Green, O.

CHEMISTS, ASSAYERS, SAMPLERS OF ORES, ETC.

ORES SAMPLED, TESTED, AND ASsayed. Analysis of ores, fuels, limestone, iron and steel, clay and cements. Ethelbert Ely, Dover Laboratory, Dover, N. J. Established 1868.

LET US HAVE YOUR SPECIFICATIONS
ON SINGLE DUPLEX & ROTATIVE
STEAM AND POWER

PUMPS

THE JOHN H. McGOWAN CO.
CINCINNATI

SIMPLE COMPOUND & COMPOUND CONDENSING
ELEVATOR & WATER WORKS
PUMPING ENGINES

ANGLE IRON

6 tons ⅛" x ⅛" x ⅛" New Angle Iron. Bargain at $35.00 per ton, f. o. b. New Orleans, La.

ELECTRIC MFG. COMPANY
New Orleans, La.

Grey Iron Foundry

Fully Equipped and in Operation

For sale, Lease, or will consolidate with a responsible concern that are large users of gray iron castings. Daily capacity of foundry 50 to 100 tons. Located on several railroads in Chicago district. Ten acres of land. Will make a first-class plant for car repair or machinery shops. Will make liberal terms to a first-class, responsible concern which wants to buy or lease. Will take stock with a reputable manufacturing company that wants to consolidate and might subscribe if necessary for additional capital.

Address **E. F. KENNEDY,**
537 Rookery, Chicago, Ill.

Factory Window Sash For Sale

60—12-Light Sash, 12 x 14" glass.
288— 9-Light Sash, 12 x 14" glass.
18— 6-Light Sash, 12 x 14" glass.
56— 9-Light Sash, 12 x 12" glass.

Good quality White Pine and glass. These sash are new—never used. Also have new Hemlock Window Frames and Door Frames. Write for list.

H. M. Loud's Sons Co.
Dept. K,
AUSABLE, MICHIGAN

p.

30"x48" CORLISS — HEAVY DUTY ENGINE

Bass Foundry Make Latest Design
Steam and Gas Engines, Compressors, Boilers, Shears, Steam Hammers, Fly Wheels, 22 in. Bar Mill

1—40 ton Alligator Shear, cuts 4 1-2 in. sq. 48 in. Rotary Squeezer. 1—18 in. Muck Mill

SPECIAL BOILERS

2—310 horse power each. B. & W. Horizontal Water Tube Boilers complete. Nearly new. First-class condition.

LOCOMOTIVES FOR SALE

1—30 in. gauge four wheel saddle tank locomotive, in first class condition. Ready for shipment.

1—Standard Gauge 4 Wheel Saddle-tank 15 in. x24 in. Locomotive. 35 tons. Penna R. R. make, first-class condition. Ready for delivery.

B. M. EVERSON
German Nat. Bank Bldg. (6th and Wood), Pittsburg, Pa

Boilers, Engines, Etc.

For Sale at Wrecking Prices!

We have in stock ready for immediate delivery the following items, on which we are prepared to quote extraordinary low prices.

ENGINES

1—28x60 L. H. Hamilton Corliss Engine.
1—24x48 L. H. Atlas Corliss.
1—18x42 L. H. Hamilton Corliss.
1—14x42 L. H. Atlas Corliss.
1—12x30 L. H. Atlas Corliss.
1—15½x16 R. H. Automatic Buckeye Engine.
1—13x12 Center Crank Automatic New York Safety Engine.

PUMPS

1—16x14x10 Worthington Duplex Steam Pump.
1—14x7x10 Worthington Duplex Steam Pump.
1 No. 15 Morris Centrifugal Sand and Drainage Pump direct connected to vertical 12x10 Engine.
1 No. 15 Belted Morris Centrifugal Pump.
1—200 M. P. Cookston Water Heater.

BOILERS

2—13x14 Butt Strapped Double Riveted Horizontal Boilers.

5—500 H. P. Babcock & Wilcox Water Tube Boilers, 150 lbs. pressure. Used only three years.

6 Horizontal Tubular Boilers, 72x20, Quadruple Riveted, good for 110 lbs. steam pressure.

1—125 H. P. Internally Fired Boiler, with Morrison Corrugated Furnace.

1—13 and 20 x 14 Tandem Ideal Compound Engine direct connected to 100 K. W. General Electric, 125 volt Direct Current Generator, thoroughly overhauled; practically new.

CAR TANKS AT SACRIFICE PRICES!

Buy from us and save 20 to 75%.

We have several hundred Car Tanks coming off of railroad tank cars made of ¼ in. steel; heads are 5-16 in. thick, and are equipped with standard dome; 15 in. screwed manhole on top of dome. These range in capacity from 3 to 8,000 gallons each. Each tank is thoroughly tested prior to shipment and made absolutely tight. We consider them as good as new. We have them located at Whiting, Ind., Kansas City, Mo., Lima, Ohio, Cleveland, Ohio, Buffalo, N. Y., and Olean, N. Y. Write for prices.

Catalog No. 682 mailed free on request.

RADIATION, IRON PIPE, BELTING, ETC.!

5,000 feet Steam Radiation in first class condition, price per foot, 13 cts.
50,000,000 feet of Iron Pipe Radiation in sizes from 3-8 in. to 12 in.
Complete stock of Rubber and Leather Belting, Shafting, Hangers and Mill Supplies.
Write for our prices on Lumber, Sash and Mill work for factory construction.
We are making low quotations on Structural Iron and Steel.
We have a large stock of merchandise of every description, and can supply almost every want of the builder, contractor and purchasing agent.
Send us a complete list of what you need for our estimate. We can save you from 30 to 75 per cent. on the entire bill. Write today for our special bargain catalogue 682, illustrating and describing thousands of astonishing bargains in merchandise constantly required about the home, farm, field and factory. Mailed free to all who request a copy.
We also publish an office furniture catalogue, which is a complete reference book and should be in the possession of every one needing office supplies of any kind. Write today telling us that you want this catalogue and they will be mailed you immediately upon receipt of your communication. Ask for No. F-682.

CHICAGO HOUSE WRECKING CO., 35th and Iron Sts., Chicago

For Sale

Three Northern generators, 200 kilw. each; Direct-connected to Ames engines, 325 H. P. 18x18.

Inland Steel Co.
Chicago, Ill.

B. Nicoll & Co.

922-923 First National Bank Building,
Chicago, Ill.
Dealers in
Iron and Steel Scrap.
Pig Iron, Coal and Coke.

FOR SALE—Machinery Bargains

LATHES

19 x 8 Lodge-Barker, comp. rest, solid spindle.
24 x 12 Flather, raised to 30 in. comp. rest, hollow spindle.
26 x 12 Blaisdell, comp. rest, hollow spindle.
60 in. Stevens Pulley Lathe.

PLANERS

32 x 30 x 10 New Haven, Single Head.
40 x 40 x 11 Aldrich & Calvert, single head.

SHAPER

20" Lodge, Davis & Co., Geared.

MILLER

Duplex Brass Miller.

ENGINES

Corliss, Automatic, and Throttling, all sizes.

BOILERS

Tubular, Fire Box and Vertical, all sizes.

MISCELLANEOUS

Pumps, Heaters, Tanks, Wagon Scales, Saw Mill Machinery, etc.

We are sole manufacturers of the celebrated "Leader" Injectors and Ejectors.

THE RANDLE MACHINERY CO.
1747 Powers St., Cincinnati, Ohio

A. G. HATHAWAY & CO.
THE
FENESTRA
Steel Sash
Cheap as Wood
Fire Proof
CLEVELAND OHIO

FOR SALE

4100 tons 15-inch new Steel Channels, 33 lb., 30-ft. engths—Lackawannaproduct. We also have the clamps for converting this into steel piling.

WALTER A. ZELNICKER SUPPLY CO.
IN ST. LOUIS P

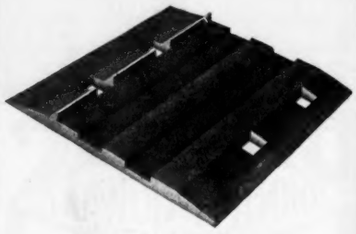
BARGAINS

Alternating and direct current motors, dynamos; also plating dynamos at bargain prices.
All makes and sizes, sold, bought and repaired.

EUGENE L. RICHTER ELECTRIC CO.
N. E. Cor. Uber and Columbia Ave.
Dept. C. Philadelphia, Pa. p

(Patented)

"When a Manufacturer finds it necessary to imitate an article already renowned, he admits that he is incapable of initiative and originality."



(Patented)

In other words he is a Business Pirate

In this connection beg to call attention to the following letter from our Patent Attorneys:

C. Clarence Poole.
Taylor E. Brown.
William P. Hall.

Branch Office
Ouray Building,
Washington, D. C.

Poole & Brown,
Attorneys & Counsellors,
Suite 808 Marquette Building,
Chicago, Ills.

CABLE ADDRESS "POOLE BROWN" CHICAGO.
TELEPHONES CENTRAL 1225. AUTOMATIC 4227.

PATENTS. COPYRIGHTS. TRADE MARKS. CORPORATIONS.

December 16th, 1908.

The Railroad Supply Company,
Bedford Building,
Chicago, Ill.

Gentlemen:-

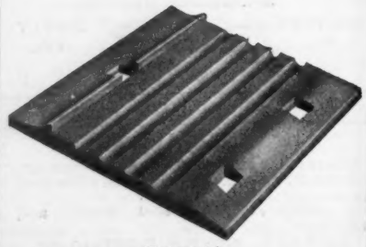
We beg to report that, in accordance with instructions received from you, on December ninth we began a suit for infringement in the U. S. Circuit Court at Cleveland, Ohio, against The Elyria Iron and Steel Company of Elyria, Ohio, and on December eleventh we started a like suit in the U. S. Circuit Court at Chicago, Illinois, against the Hart Steel Company of Elyria, Ohio, and its selling agent in Chicago, Guilford S. Wood.

In these suits the defendants named are charged with infringing your patents covering railway tie-plates provided with grooves, ribs or corrugations in or upon the top surface thereof. By the bills of complaint filed in said suits it is asked that injunctions be issued by the courts named prohibiting further manufacture and sale of any such infringing tie-plates by the defendants, and that the latter be compelled to pay to The Railroad Supply Company damages, profits and costs arising from or growing out of the manufacture and sale of the infringing tie-plates.

Yours very truly,

Poole & Brown.

Dictated to the Graphophone By and Transcribed by.

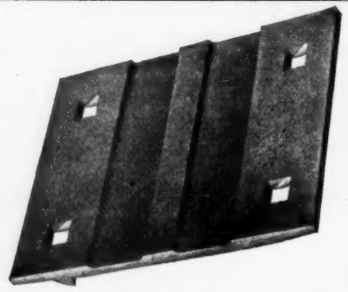


(Patented.)

THE RAILROAD SUPPLY COMPANY

Bedford Building

Chicago, U. S. A.



(Patented)